How Sound Is This Clamor for Salvation by Budget-Balancing?

NEVER during the present generation have policy-determining officials faced tasks of such perplexing difficulty as confront them today. From unemployed millions come cries of distress hardly audible amidst the clamor of other millions for taxation relief.

Instead of the united action of a great military emergency, we have the divided counsels of an even greater economic crisis. Now, if ever, is there need for courage and statesmanship of a high order. And may we not even find some place for that self-sacrifice in the public interest which helped so greatly in the troubled days of 1917-18?

Especially must we avoid being led astray by the worship of false gods in the guise of high-sounding slogans. One such which needs careful scrutiny is the oft-proclaimed insistence that we balance our budgets.

Wasteful or illegal expenditure of public funds is, of course, a vicious practice at any time. In normal times budget-balancing, properly interpreted, is good business for family units and governmental units alike. But when disaster overtakes a member of the family unit, budget-balancing is promptly and properly forgotten; savings or future earnings are pledged to meet the emergency need. And so it is when war overtakes a governmental unit. But in our present economic crisis we are asked to believe that salvation can be reached only along a narrow and budget-balanced pathway, in the trimming of which the national government and the states and their subdivisions must all meekly join. Not sacrifice and high endeavor, but hoarding and cost-cutting become the gospel of 1932. The fundamental folly of such a gospel is scored by most of our leading economists, several of whom are quoted on pages 51 and 52 of this issue.

And How Sound Is the Insistence on Self-Liquidating Public Works?

From Washington and Wall Street comes the word that new municipal bond issues will have Government aid only if they provide for public works which are "income-producing" or "self-liquidating." Let us by all means build "productive" public works wherever they are needed. Water works and a few other utilities in this category are receiving high official and professional blessing—which we hope will be followed by ample funds for new construction and needed improvements. But let us not allow street, highway and sidewalk improvements, schools, playgrounds, fire and police stations, sewage and garbage disposal plants and other needed and well-planned public works to go into the discard merely because their cost comes ultimately out of the tax pocket instead of from some other pocket. How much would land in our cities be worth if such improvements were to stop?

The essential distinction, of course, in a program of public works is its *service*-producing and not its direct *income*-producing character. Wise expenditures for public improvements are reflected in land-value increases sufficient, under a scientific system of taxation or assessment, to cover interest charges and amortization of the bonds. Combining, thus, immediate advantages in jobs for workers and sales for manufacturers with permanent values to the community, we find in a rational program of well-planned public works on a nation-wide scale our greatest hope for changing the present curse of unemployment into the blessings of renewed prosperity. And meanwhile enormous sums will be saved that otherwise would be dissipated in the payment of doles. We have much less to fear from using red ink in our counting houses than from provoking Red talk in our meeting houses.

And How Sound Is the Clamor for Hand Work and Local Labor?

Another specious idea sometimes forced on public officials is the discarding of labor-saving equipment in new construction activities. The substitution, for example, of the old pick-and-shovel method for modern ditch-digging and road-building machinery is a waste of tax funds. As some one has well asked, if hand shovels are to be preferred to steam shovels, why not substitute salad forks for the hand shovels and thus get still less for our money?

Because the steam shovel factory or the cement plant or asphalt plant are not in our own town, must we spend our money for hand-built dirt roads instead of machine-built paved highways?

Have We the Vision to Plan and the Boldness to Act?

No city can dig itself out of the present economic mire by hand shovels—or salad forks. The depression has come upon us in the grand manner—and can be banished only in a still grander manner.

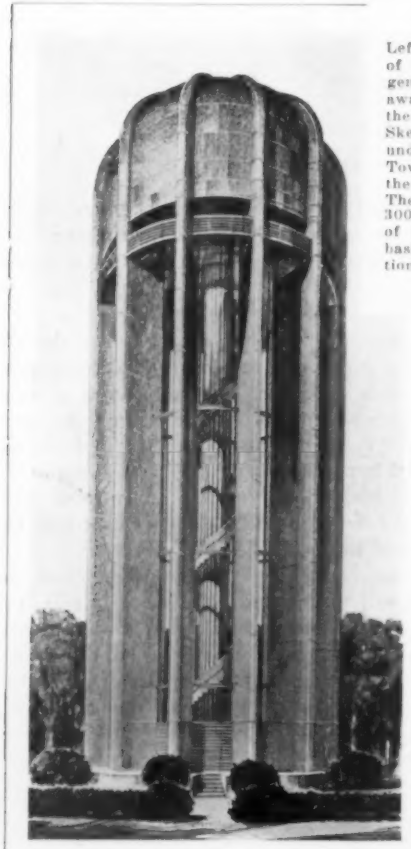
Can we afford to proceed vigorously with such a program as is here suggested? Can we afford not to do it? Is it not high time to halt the spread of false propaganda reflecting on the fundamental financial soundness of our units of local government? With few exceptions our municipalities and counties, notwithstanding the fiscal problems of the last two years, are safely below statutory limits of taxing and bonding power. In many cases (see page 58 of this issue, for example) such limits could be increased, legally and safely, by legislative act.

The present month seems likely to witness action in Washington which will make available Federal funds for income-producing utilities and perhaps also for slum clearance and large-scale housing developments. If that is as far as Congress or the President will go, and if adequate cooperation is not obtainable from bankers and investors, municipal statesmanship will carry the fight to the state legislatures in regular or special session. The funds can be had somewhere for service-producing public works if demanded with sufficient vision and vigor.

The time has come to combat the defeatism which, by stopping public expenditures and tax payments, would bring about the virtual collapse of local government. And the time has come for effective cooperation among all officials and taxpayers who are willing to plan and spend boldly and wisely for the common welfare.

The goal is the physical and moral salvation of millions of our fellow citizens.

BALTIMORE SELECTS the first prize tank design in our recent international competition



Left: Photographic copy of the design by Eugene Voita which was awarded first prize in the competition. Right: Sketch of the tank now under construction at Towson, Maryland, for the City of Baltimore. The capacity is to be 300,000 gallons instead of 200,000 used as a basis in the competition.

WE recently sponsored a competition to develop a general aesthetic improvement in elevated water tanks. One hundred fifty-two designs were submitted. While some were quite elaborate, many others embody ideas that can be utilized at no great additional expense over standard designs.

It is pleasing to note, therefore, that the city of Baltimore has adopted, almost without change, the first prize design in this competition. Other cities also are considering the use of some of the designs developed in the competition. Information on either standard or special tanks will be furnished by our nearest office.

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.	Dallas	1206 Burt Bldg.
New York	3108 Hudson Terminal Bldg.	San Francisco	1033 Rialto Bldg.
Cleveland	2236 Midland Bldg.	Seattle	4343 Smith Tower
Detroit	1501 Lafayette Bldg.	Houston	2919 Main Street
Philadelphia	2616 "1616" Walnut St. Bldg.	Tulsa	1425 Philcade Bldg.
Boston	1501 Consolidated Gas Bldg.	Los Angeles	1303 Pacific Mutual Bldg.
Birmingham	1502 Fiftieth St., N.	Havana, Cuba	Apartado 2507

PLANTS IN CHICAGO, BIRMINGHAM, AND GREENVILLE, PA.

HORTON TANKS

AC6 Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Service Pipes—Corrosion and Red Water

THE seepage of water through decomposing organic matter in the soil, and the treatment of water with alum, leads to the presence of carbon dioxide gas in the water. The gas is harmless in itself, but it greatly increases the corrosiveness of water to metal pipes. This is of great practical importance, because corrosion will shorten the useful life of the pipes, and will lead to the presence of iron, copper, zinc, or lead in the water, depending upon whether cast iron, steel, copper, brass or lead pipe is being corroded. Whenever iron is present in water in appreciable quantities, the water has a red or "rusty" appearance and clothes or plumbing fixtures are stained. Copper, brass, lead and cement-lined iron pipes corrode much more slowly than iron or steel, and thus these more expensive pipes are frequently used in place of wrought iron or galvanized iron pipes for buildings.

Experience indicates that zinc corrodes more rapidly than copper, so that galvanized iron pipes coated with zinc, and brass pipe which contains zinc as one of the alloy metals, corrode much more rapidly than red copper pipe, according to a statement of the New York Department of Health in its booklet, "The Protection and Chlorination of Public Water Supplies." There is no indication that the quantity of zinc and copper liberated by the corrosion of pipe is sufficient to poison consumers of the water. This is not true, however, when lead pipe is corroded, because lead is a cumulative poison, which has been shown to cause definite poisoning of consumers when the water contained over 0.3 to 0.5 p.p.m. of lead. This content is likely to be exceeded when very soft and acid waters containing appreciable quantities of carbon dioxide are conducted through lead pipe.

It is therefore apparent that the carbon dioxide content of water is an important factor influencing the quality of the water. Thus the prevention of corrosion is an important phase of water treatment, although insufficient attention has been given the subject in many instances. Where it is impractical for any reason to control corrosion, the use of copper or brass pipe, or cement-lined iron pipe, is both economical and desirable.

Location of Fire Hydrants and Pipe Systems to Supply Them

IN supplying water for domestic and ordinary commercial uses, a distribution system composed of small pipes would be sufficient, and in not a few villages mains mostly 1½ to 4 inches in diameter with a few 6-inch and branch pipe 1, ¾- and even ½-inch in size are found. A few hydrants may be found in such cases on 6- and 4-inch pipes and occasionally on a pipe as small as 2-inch. Effective fire streams cannot be supplied from such small mains, and almost no protection is afforded by hydrants on them. On the other hand, they give to the average citizen a false sense of security from which he may be rudely awakened by a bad fire.

Fire insurance companies, largely through the engineering department of the National Board of Fire Underwriters, and the Associated Factory Mutual companies, have built up in the past 25 years a technique of fire protection practice and have gradually raised the standard for sizes of street mains and general adequacy of water supply systems.

It is obvious that a large part of the cost of a modern water distribution system is caused by fire protection requirements, though only a negligible part of the water used is actually employed to put out fires. When a fire occurs, water is needed at a high rate of draft, generally only for an hour or so, and this requires relatively large pipes. Six-inch pipes have become almost universally the smallest size of pipe permitted, and in some large cities nothing smaller than 8-inch is permitted.

The size of hydrants is also important. When they are not large enough, much pressure is wasted by the water passing through the hydrants at excessive velocity. Good practice requires that no hydrant shall be used with the main valve opening less than 4½ inches in diameter. Larger hydrants are used in the larger cities.

Spacing of hydrants is prescribed by the insurance boards according to the nature of the development, close spacing being required for business and apartment house districts, and wider spacing for suburban developments with detached houses on fairly good-sized lots. The standards of the National Board of Fire Underwriters list hydrant spacings for different conditions in terms of number of square feet of territory which each hydrant has to serve. Good practice requires a hydrant spacing of not to exceed 500 feet.

The mere existence of hydrants spaced at distances required by the rules does not entitle owners to the lowest insurance rate for such a location, since the rate for any property is determined by an elaborate system of scoring according to rules which take into account all the conditions, such as adequacy of supply, possession of duplicate supply mains, duplicate pumps and duplicate sources of power for pumps, elevated storage reservoirs of sufficient capacity, adequate size of mains, and results shown by hydrant flow tests of the system; and in addition to the water supply, the equipment and efficiency of the fire department, the fire alarm system, building inspection and general safety service are factors.

Many distribution systems suffer always from the inadequacy of the original pipes installed. Pipes originally less than 4 inches in diameter in general must be replaced if reasonably good fire protection is to be obtained, but the replacement of 4-inch pipe with proper 6-inch or larger pipe is a slow process because of the expense and the fact that the 4-inch pipe will do after a fashion if it is reinforced by larger mains in intersecting streets. Therefore, it is highly desirable to put in an adequate system in the first place and to use pipes protected so that they will not become reduced in capacity by rusting. Nearly all pipes in past times have become reduced in capacity from 15 to 60 or more per cent by rusting or tuberculation. In recent years pipes with cement lining or with thicker bituminous coating have become commercially available at comparatively low cost and should be used. They have shown promise of retaining at least 85 to 90 per cent of their original capacity indefinitely. Such pipe will greatly improve hydrant capacity.

—From the report of the Committee on Utilities for Houses of the President's Conference on Home Building and Home Ownership.

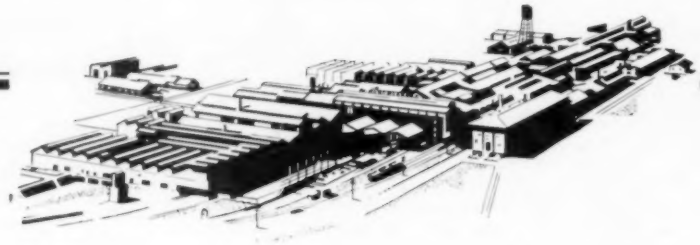
Improvement in Pumping Station and Filter House

THE pumping station and filter house of East Providence, R. I., water works has undergone considerable improvement during the past year. The 1,000-gallon DeLaval pump and motor were completely taken down and overhauled for the first time in six years. The settling basin and the clear-water wells were thoroughly flushed out and scrubbed at regular intervals throughout the year. Two filter units were completely overhauled, the sand and gravel cleaned and regraded, the strainer heads opened and other repairs made to put these units in first-class condition.

The sterilization of the water is now done by chloramines, a combination of chlorine and anyhdrous ammonia gas. This method is coming into extensive use, for it eliminates certain tastes and odors; but in East Providence it allows prechlorination, which results in sterilization of the filters and the clear-water well.

JAMES V. TURNER,
Superintendent, Water Department.

PUBLIC WORKS *or* THE DOLE?



At the date of this writing (May 25th) it seems certain that the Federal Government will stimulate the market for securities of local governments, in order to initiate a nation-wide program of local public works construction, which, *simultaneously undertaken* will act quickly to relieve unemployment and thereby banish the shadow of The Dole (and attendant taxation) from the American scene.

In this connection, Acipco invites the attention of municipal authorities, engineers, contractors and all others interested in the construction of local public works, to these fundamental facts:

1. Sponsors of Federal finance for local public works definitely specify that preference be given to those projects in the largest measure *self-supporting*: waterworks systems, sewage disposal and filtration plants lie well within this qualification. These projects not only can be made to pay for themselves, but also add to city revenues.

2. It is logical to assume that preference will also be given to those public works which hold the greatest employment possibilities, both from the standpoint of local hand labor and labor required by industrial plants to produce needed materials; projects including the use of cast iron pipe offer generous employment schedules, nicely balanced.

3. The American Water Works Association conservatively estimates the amount of waterworks construction needed in America today to secure a universally high standard of service for fire protection and water quality and service at $550,000,000 of which amount $350,000,000 is for extension of and reinforcement of distribution systems. The cast iron pipe industry is operated at a general average of 25 per cent capacity. Assuming then, that about 70 per cent of this $350,000,000 would go for cast iron pipe, a gross order of $245,000,000 would be placed with the cast iron pipe industry which would step up production from 25 per cent to 100 per cent for almost three years. Production (and attendant employment) would be similarly stepped up in coal and ore mines, blast furnaces, coke ovens, railroads, machinery manufactures, and other industries contributing to cast iron pipe production; commissaries and supply houses immediately would be stimulated. An upward movement of considerable proportions would result. And every nickel of this $245,000,000 order would constitute a *permanent, paying investment* for the cities making the installations.

4. The ACIPCO organization is fully prepared to cooperate from every angle with any municipal authority, engineer or contractor in both the promotion and construction of projects involving the use of cast iron pipe and fittings. We offer the facilities of America's largest individual cast iron pipe foundry, which includes the services of an engineering staff backed by ACIPCO'S quarter-century of experience in planning, designing, manufacturing and helping supervise the installation of high-quality cast iron pipe and fittings.

As Walter Lippmann concisely suggests: "There comes a time in every depression when the way to resume is *to resume*." Acipco promises energetic cooperation to individual plans designed to resume needed construction, involving the use of its products, in any given locality. Address ACIPCO office nearest you.

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SEATTLE
DALLAS
KANSAS CITY
NEW YORK CITY
CHICAGO
CLEVELAND
MINNEAPOLIS
LOS ANGELES

Construction and Maintenance

Engineering and Highway Departments

Method of Handling Utility Cuts in Beaver Falls, Pa.

A CITY ordinance requires that any one desiring to make a cut in a city pavement must secure a permit from the City Clerk. The issuance of the permit costs 50 cents, and to this is added a deposit, which is required to be made in cash or certified check, amounting to $1.00 per foot of trench. The applicant cuts the pavement, backfills and replaces the surface on improved streets. All cuts are to be filled with concrete to the bottom of whatever type of paving is on the street, and the concrete is to be made one foot wider than the trench, on each side, so that the base shall have firm ground upon which to rest. The work is inspected after sixty days by the City Engineer or Street Commissioner, and if the work is approved, certification is made to the City Clerk, and the deposit is returned to the applicant.

IVAN P. LINDEMAN,
City Engineer.

Both Permit and Bond Required for Paving Cuts

A CITY ordinance in York, Pa., requires a permit for paving cuts and a bond for $500. Replacement of pavement is done either by the city or by contract. For purposes of estimate the following charges are used: $7.45 per square yard for brick, grouted in cement on a 6-inch concrete base; $5.25 per square yard for brick or wood block grouted with sand or pitch on a 6-inch concrete base; $12.00 per square yard for sheet asphalt on a 6-inch concrete base; $8.50 per square yard for reinforced concrete; $2.10 per square yard for cobblestone, brick, gutters, etc., on earth base; and 50 cents per square yard for macadam. The charge to the applicant is the actual cost of repairs plus 10 per cent for inspection. The estimates are made high, so that if a little more area is excavated than is intended, the city does not have to ask for an additional payment.

C. F. W. WALLOW,
City Engineer.

Methods and Charges for Repairing Cuts on Paved Streets in Altoona, Pa.

THE city of Altoona requires a permit for any cut in the pavement of its city streets. The cash deposit required is computed by the City Engineer for an area 1 foot beyond the edge of the trench on all sides. The deposit for 1 to 5 square yards is $40 and for 5 to 10 square yards $80, and all cuts over 10 square yards are charged at the rate of $8 per square yard. The street surface is replaced by city forces. If the cost of replacing the pavement exceeds the deposit, the applicant is required to pay the difference. If the cost is less than the deposit, there is a refund to the applicant.

HENRY J. BAUM,
City Engineer.

Deposit for Pavement Cuts Held for Six Months

IN Reading, Pa., a city ordinance requires the issuance of a permit by the Bureau of Permits and Records before any pavement cut can be made. A deposit is required and is held for six months, during which time city forces restore the surface of the cuts. The deposit is figured at the rate of $10 per square yard for wood block paving, $8 per square yard for brick, hot mix asphalt, granite block, or concrete pavement, $6 per square yard for bituminous macadam and $4 per square yard for waterbound macadam and miscellaneous unimproved streets. If the actual cost to the city is lower than the deposit, there is a refund; and if the cost is more, the applicant is billed for the difference.

E. CLINTON WEBER,
City Engineer.

A Financing Plan for County Highways

WITH the number of miles of road in the county and the density of population as a guide, it is suggested that the counties be permitted to designate mileage which when combined with the state mileage in the county shall not exceed 20 per cent where the population is less than 50 per square mile; 25 per cent where the population is between 50 and 100 per square mile; and 30 per cent where the population is over 100 per square mile. The proceeds of a 3-cent state gasoline tax should be divided between the state and the counties on the basis of one cent to the state, one cent prorated to the counties on the basis of motor-vehicle license fees, and one cent to the counties on the basis of mileage of roads under county jurisdiction, provided the county levies the maximum highway tax rate on general property; otherwise the amount so prorated to be in proportion to the rate levied; the state to receive in addition to the above-mentioned one cent surplus motor license fees and Federal Aid.

All county funds for highways should be combined and budgeted annually, an accounting made to the state highway department, and plans for all new highways and maintenance in excess of $1,000 per mile per year be subject to the approval of the state highway department.

County boards should set aside 25 per cent of the total road fund for the improvement, upon petition, of city streets connecting and completing state and county routes through cities, or major streets in cities having a city plan. The maintenance of all roads constructed by the county should be handled entirely by the counties.

B. C. McCURDY,
County Highway Superintendent, St. Clair County, Ill.

Ditch Checks Built of Creosoted Timber

ONE of the chief items of road maintenance is the protection of side ditches and shoulders from serious erosion. If not controlled, the rapidity with such erosion takes place varies with the nature of the soil, the slope of the drainage ditches, and the amount of the rainfall. Natural or artificial grassing of right-of-way slopes and ditches tends to overcome the erosion of earth, but frequently the conditions are such that vegetation roots cannot alone retard the loss of road material.

In cases of this kind, it is wise to resort to the use of ditch checks so designed and placed that permanent flow lines are established for the highway drainage ditches. When this has been done, rainfall run-off can be stepped down over the ditch checks with little or no erosion of the right-of-way ditch or the slopes. By placing such ditch checks at the time the road is constructed, the loss of earth from the roadbed may be reduced to a minimum, since the eroding action of the first rains on new embankments is usually quite severe.

Pressure-creosoted lumber is frequently utilized to build ditch checks for highway protection, according to *Wood Preserving News*. It is very effective for that purpose, as well as economical in first cost and in cost per year in place. Such structures of treated lumber can be easily salvaged or moved to another location in case of relocation or widening of the right-of-way.

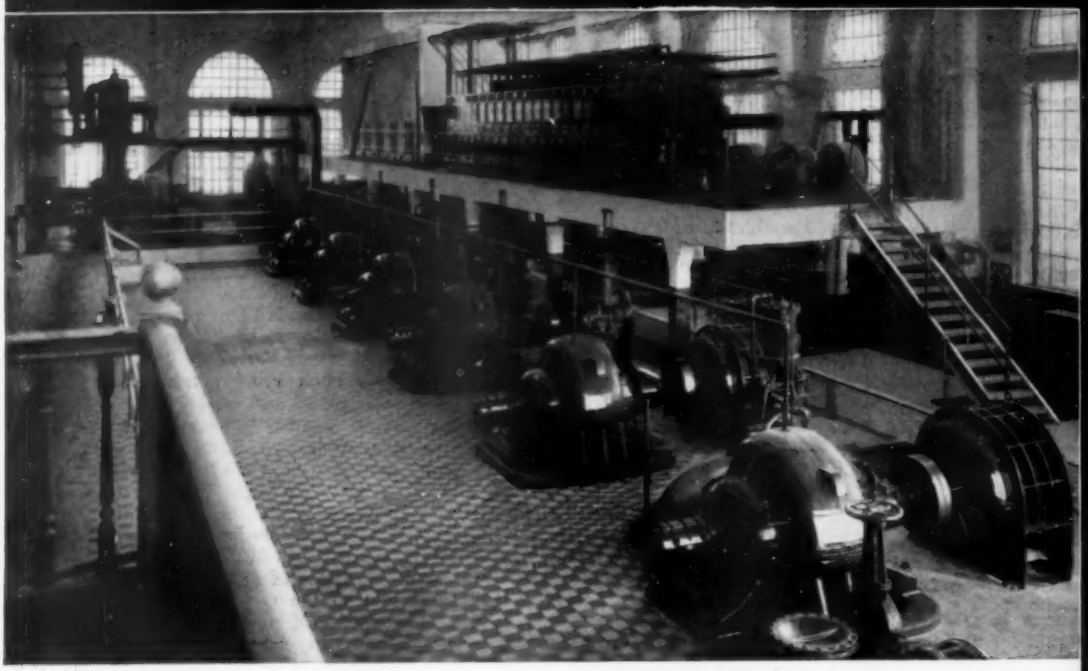
A large quantity of lumber pressure-treated with Grade One coal tar creosote has been used by the Missouri State Highway Department in recent years for ditch checks.

208 Miles of Streets in Fort Smith

THE total street mileage in Fort Smith, Ark. (1930 census population, 31,429), is 208.6 miles, with 82.25 miles of alleys. The street mileage consists of 39.21 miles of brick pavement, 46.07 miles of concrete pavement, 16.42 miles of asphalt pavement, and 17.95 miles of macadam, making a total of 119.65 miles of paved streets.

H. S. PECK,
City Engineer.

"IN EXCESS OF THE GUARANTY"!



THE Torresdale Station in Philadelphia—six Fairbanks-Morse 36-inch centrifugals each direct-driven by a 600 hp. F-M Motor—capacity, 300,000,000 gallons per day. After installation—tests show wire-to-water efficiencies in excess of guaranty. And *now*—three and one-half years later—tests still show efficiencies and capacities "in excess of guaranty."

Wherever a municipality has water supply or sewage disposal plants—F-M Centrifugal Pumps, F-M Turbine Pumps and F-M Motors of both induction and synchronous types are turning in performance records which exceed the guaranties in the bid.

This extra value is but naturally passed on to municipal budget savings and the credit of the responsible city officers.

No city is too small—none is too large—but that it may profit by the spirit of the F-M organization and the sound worth of the products which "exceed guaranties."

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STEPHEN H. TAYLOR
Supt., Water Works
New Bedford, Mass.
Director, American Water Works Association

THOMAS J. SKINKER
Engr. in Charge of Distribution
St. Louis, Mo.
Director, American Water Works Association

J. ARTHUR JENSEN
Engr., Water Works
Minneapolis, Minn.
Director, American Water Works Association

C. R. KNOWLES
Supt., Water Service, Illinois Central System, Chicago, Ill.
Director, American Water Works Association

Who's Who in Water Supply

One of a Series of Portraits of Water-Works Officials Which Has Appeared Monthly Since January, 1928

A. P. MICHAELS
Gen. Mgr., Orlando Utilities Commission, Orlando, Fla.
Director, American Water Works Association

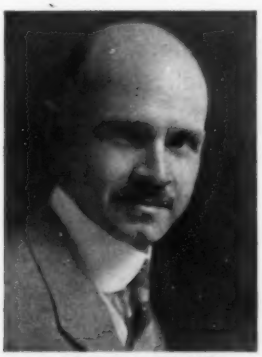
WALLACE W. MOREHOUSE
Director, Dept. Water and Sewers
Dayton, Ohio
(Appointed 1922)

PETER J. WINTGENS
Supt., Water Works
Ford City, Pa.
(Appointed 1912)

L. D. SHANK
Mgr., Light & Water Dept.
Dover, Del.
(Appointed 1926)

B. FRANK STOLTZFUS
Supt., Water Works
Laurel, Miss.
(Appointed 1903)

F. HURD ROBINSON
Supt., Public Works
Hornell, N. Y.
(Appointed 1913)



ALBERT S. BLANK
Supt., Water Department
Belleville, N. J.
(Appointed 1924)

O. D. SLICHENMYER
Supt., Water Works
Olney, Ill.
(Appointed 1913)

IRVING D. LEE
Supt., Water Works
Madison, S. Dak.
(Appointed 1922)

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Badger Model A-SOT equipped with breakable bottom plates which in the event of freezing give way with the expansion of ice and relieves the working parts of abnormal pressure.

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BADGER *Water* METERS

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Pre-Aeration at a Sewage Treatment Plant

AFTER two years of testing-station development, the pre-aeration unit for the Decatur, Ill., plant was designed and built. The test data indicated that with a 2.5-hour aeration period from 30 to 40 per cent reduction in the 5-day oxygen demand of the settled sewage could be anticipated, and that the settled aerated effluent could be successfully applied to the sprinkling filters at three times the rate in million gallons per acre per day that could be used with the un-aerated sewage.

The pre-aeration plant is a short-period activated-sludge plant which is placed between the Imhoff tank and the dosing tanks, the purpose of which is to reduce the bio-oxygen demand on the influent to the filters and to modify it so that the rate on the sprinkling filters may be increased.

There are six aeration tanks of the spiral-flow type which have a total displacement period of 2.5 hours at a sewage flow of 10 m.g.d. plus a sludge return of 1 m.g.d. The six tanks are arranged in three pairs for metering the incoming sewage. The flow of air is also separately metered to the three pairs of tanks and the conduits. There are two 77.5-foot Dorr clarifiers for settling the aerated sewage, which had a total displacement period of 2.6 hours and a settling rate of 833 gallons per 24 hours per square foot of surface. The sludge is returned to the influent conduit without provision for pre-aeration, and to the influent of the Imhoff tank for sedimentation and digestion with the primary sludge.

The designed and expected total capacity of the enlarged plant was 150,000 population equivalent, with the following removals by the various units: 32 per cent, or 48,000 population equivalent, to be removed by the Imhoff tank; and 24 per cent, or 36,000, by the pre-aeration unit, thus leaving 66,000 population equivalent to be handled on the sprinkling filters and final sedimentation, which amounts to a loading of 22,000 population per acre of the filters, which are 6 feet deep.

The operating data clearly indicate that the pre-aeration plant as it exists and as it is operated reduces the influent bio-oxygen demand between 30 and 40 per cent. This reduction takes place in either the presence or the absence of returned sludge. It must be easily oxidizable matter that is removed by chemical oxidation, mechanical sweeping out of solution of volatile matter, or biological decomposition that takes place very rapidly. If the improvement is biological, sufficient innoculation must exist on the walls of the aeration tank or be introduced from the returned sludge which is mixed with the raw sewage before settling in the Imhoff tanks.

—From a paper presented before the Central States Sewage Works Association by William D. Hatfield, Superintendent, Decatur Sewage Treatment Works.

Pumping Equipment at the Allentown Sewage Treatment Works

THE new sewage disposal plant at Allentown consists of rack chamber, pumping station and laboratory, two detritus tanks, screen and incinerator house, six Imhoff tanks, ejector house, chlorinating house, sludge beds and garage. It was designed for an estimated population of 128,000 in 1935, with an average daily flow, at that time, of 17.3 m.g. and a maximum of 34.6 m.g. The capacity of the main sewer entering the plant is 59 m.g.d. The plant is so arranged that similar duplicate units may be added to double the present capacity. The incoming sewer is provided with an overflow for emergency use only, such as might result from interruptions of power.

The main pumping equipment consists of three motor-driven centrifugal pumps. These pumps comprise a 5.76 m.g.d. pump direct-connected to a 60-hp. motor; a 11.52 m.g.d. pump connected to a 125-hp. motor; and a 17.3 m.g.d. pump connected to a 140-hp. motor. Provision is also made for the installation of a fourth pump and motor when necessity warrants it. Between the two larger pumps is located a 300-hp. Sterling gas engine, which may be connected with any one of these pumps by a chain drive and clutch, thereby guarding against interruption of service in the event of loss of electric power.

The two smaller pumps may be operated automatically or by hand. They are provided with float switch controls so that they will start and stop automatically when the sewage in the suction chamber passes above or below certain levels. Should the sewage flow exceed the capacity of the two smaller pumping units, the high-water bell alarm indicates when the largest pump is to be started. This 17.3 m.g.d. pump is connected to a variable-speed motor permitting a discharge as low as 5.76 m.g.d. The variable speed rheostat is operated by hand.

Each pump discharge is provided with a gate valve and a Dorr pivot valve. The pivot valve serves as a check valve and operates automatically. It may also be operated by hand. A sewage-level indicator is conspicuously placed in the pump room, showing at all times the level of sewage in the suction chamber.

The sewage pumps are primed with Nash Hytor hydro-turbine vacuum pumps in duplicate installation. The priming pumps are started automatically when the vacuum in the main pump suction riser falls to 15 inches of mercury.

A Builders Iron Foundry venturi meter is located on the pump floor with a by-pass around this meter.

HARRY J. KRUM,
City Chemist, Allentown, Pa.

Stream Pollution by Sewage

FROM a utilitarian point of view, the effects of stream pollution by sewage may be summed up under the following headings:

1. Damage to water supplies, both public and industrial.

2. Injury to property values, through the setting-up of nuisances and other conditions offensive to riparian dwellers.

3. Destruction of fish and other natural aquatic life, through suffocation and introduction of toxic substances into streams.

4. Damage to streams for recreational uses.

5. Injury or destruction of the powers of streams for natural purification.

6. Damage to agricultural interests, notably through rendering surface waters unfit for use by cattle.

7. Detrimental effects on uses of streams for navigation and power.

In addition, the 1930 and 1931 drought period has afforded some presumptive evidence, not as yet entirely proved, that the excessive pollution of streams by sewage, or by certain kinds of industrial wastes thus far not identified, may result, under some conditions, in the contamination of water supplies by substances, possibly chemical in their nature, which are not removed by ordinary processes of water purification and which are sufficiently toxic to cause widespread gastro-intestinal disturbances in human consumers of the water.

The several effects enumerated above may be attributed to three general conditions in streams, resulting from sewage pollution. These are:

1. Excessive bacterial pollution, notably by organisms of human intestinal origin.

2. Over-depletion of the normal dissolved oxygen content of stream waters.

3. The presence of specific substances in stream water which may exercise toxic effects on human or domestic animal consumers of the water; may render it unfit for industrial or general domestic use; or may cause damage to bridges, dams and other structures in or along the stream.

H. W. STREETER,
Sanitary Engineer, U. S. Public Health Service, Cincinnati, Ohio.

In every drop of COLAS REG. TRADE MARK

1,000,000,000

(A Billion)

particles of Asphalt!

No wonder a COLAS road means MAXIMUM penetration and binding with MINIMUM asphalt! No wonder COLAS can be applied COLD—yet deposit perfectly a thin even film of pure asphalt around every piece of aggregate.

COLAS is an emulsion of pure asphalt. It is the result of intensive research over many years. Today it takes 82 factories throughout the world to keep up with the ever-increasing demand for COLAS Roads.

COLAS is the ideal binder for the low cost road. It requires the minimum of equipment. The pure asphalt is evenly distributed throughout the pavement insuring longest life at lowest cost. COLAS Roads from arctic regions to the tropics have demonstrated that COLAS means elimination of waste asphalt, bleeding and skidding. Experienced COLAS Engineers are available in all parts of the country.

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SHELL EASTERN PETROLEUM PRODUCTS, INC.
New York City

Licensees of Colas Roads, Inc., New York City

CHRIS P. JENSEN
County Surveyor, Fresno Co.,
Fresno, Calif.
(Appointed 1919)

HARTLEY L. WHITE
County Engineer, Norfolk Co.,
Dedham, Mass.
(Appointed 1924)

HERBERT R. PETERSON
City Engineer
Michigan City, Ind.
(Appointed 1928)

RALPH G. TAYLOR
County Engineer, Trumbull Co.,
Warren, Ohio
(Appointed 1921)

NAT H. NEFF
County Engineer, Orange Co.,
Santa Ana, Calif.
(Appointed 1927)

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials, Which Has Appeared Monthly Since April, 1928

CHARLES E. PUTNAM
City Engineer
Tacoma, Wash.
(Appointed 1928)

ALFRED H. MOORE
City Engineer
Indianapolis, Ind.
(Appointed 1927)

ERNEST L. GUYER
City Engineer
New Castle, Ind.
(Appointed 1926)

L. VARNER STINSON
County Engineer, Bryan Co.,
Durant Okla.
(Appointed 1915)

CLAUDE M. DRAPER
City Engineer
Lafayette, Ind.
(Appointed 1926)

WILBUR L. DUNN
City Engineer
Uniontown, Pa.
(Appointed 1917)

LESLIE O. MARDEN
County Engineer, Worcester Co.,
Worcester, Mass.
(Appointed 1923)

JOHN E. BREESE
County Surveyor, Allen Co.,
Lima, Ohio
(Appointed 1928)

ROBERT R. EVANS
County Engineer, Essex Co.,
Salem, Mass.
(Appointed 1907)

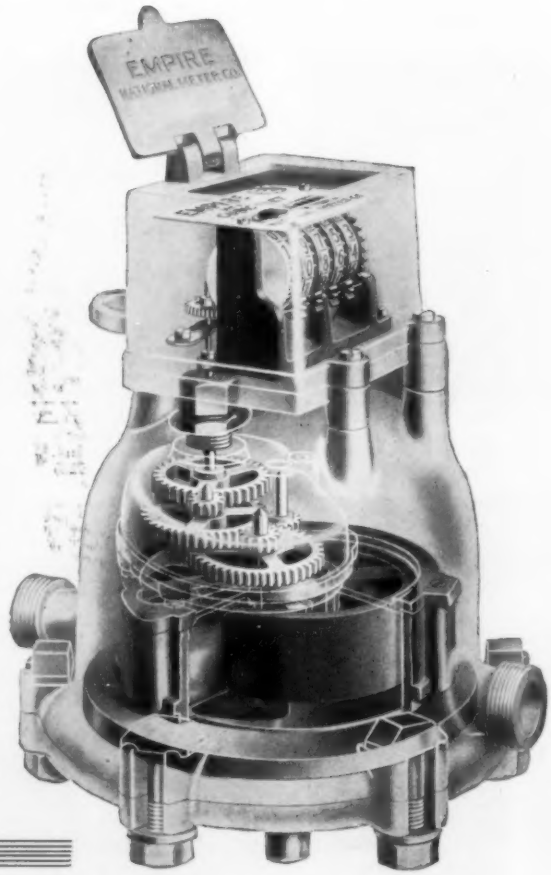
WATER METERS

OSCILLATING PISTON TYPE

THE true worth of any meter must be measured first by its accuracy. The longer it will retain its initial accuracy, the more valuable it is. This does not refer to a mere shop report, but the record of the meter under the varied conditions of actual service. It is often possible to secure highly accurate registration over long periods in a bench test, but it is apt to be quite another story when a meter is subjected to the destructive attacks that it must face when placed on the line: chemical action of water; difference in pressure; constant opening and shutting of faucets; varying degrees of temperature; foreign substance in the water; general neglect. A meter must have accuracy built right into it to measure closely in spite of all that.

The EMPIRE

will give you lasting accuracy in service. The oscillating piston moves at the slightest pressure of the water, and as it always travels in the same direction as the water flows, there is no binding, side-thrust nor strain. And note this: when EMPIRE cylinders do show wear, they do not have to be taken out and replaced with new ones; they can be remachined at nominal charge, and will then give you service for another long period, without further cost. Think of that for money-saving! It cannot be done with any other type of meter. If you have any service that you think ought to be paying better—from ⅝ to 6 inches—put on an EMPIRE and watch the revenue go up.



National Meter Company

299 Broadway, New York

Chicago Boston Cincinnati
Atlanta Houston
San Francisco Los Angeles

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

South Gate, Calif.

The city of South Gate, population 19,632, pays a single contractor to collect the garbage. The contractor uses a fleet of motor trucks for this purpose and disposes of the garbage by feeding to hogs.—H. C. PEIFFER, City Clerk.

Stockton, Calif.

The Stockton Garbage Co. collects the garbage throughout Stockton, population 47,963. The collector is paid by the individual householder.—LYLE PAYTON, City Engineer.

Torrance, Calif.

The city of Torrance, population 7,271, employs one man to collect the garbage. This man furnishes his own trucks and equipment.—A. H. BARTLETT, City Clerk.

Whittier, Calif.

A contractor paid by the city of Whittier, population 14,822, collects the garbage, using a 3-ton Graham truck and a 2½-ton American-LaFrance truck. The garbage is disposed of by feeding to hogs.—ENGINEERING DEPARTMENT.

Salisbury, N. C.

The city of Salisbury, population 16,951, collects the garbage of the city with municipally owned equipment, using two 3-ton trucks with large bodies. The garbage is disposed of in the municipal incinerator.—R. L. RANKIN, Chief of Police.

Winston-Salem, N. C.

By the use of fourteen 2-ton trucks with 7-cubic yard dump bodies, the city of Winston-Salem, population 75,274, collects all of the garbage and rubbish throughout the city expeditiously. All of the garbage and rubbish is disposed of by incineration.—HARRY L. SHANER, Commissioner of Public Works.

Jamestown, N. Dak.

In Jamestown, population 8,187, the collection of garbage is handled entirely by personal arrangement between the householders and private collectors, paid by the householders. The garbage is burned at the local dump grounds.—F. W. PINNEY, City Engineer.

Dayton, Ohio

In Dayton, Ohio, population 200,982, the city uses twelve 2½-ton trucks for the collection of garbage in the city. The garbage is disposed of by the reduction process.—GEORGE F. BAKER, Director of Public Service and Buildings.

East Liverpool, Ohio

The city of East Liverpool, population 23,329, collects all of the garbage from householders by the use of four 1½-ton dump trucks with steel bodies tapering at the rear. These trucks and the new and second Decarie incinerator where the garbage is burned were placed in service in 1930.—J. W. MOORE, Director of Public Service.

Elyria, Ohio

In Elyria, population 25,633, the garbage is collected by a contractor paid by the city and is disposed of by feeding to hogs.—JOHN N. EIDT, Service Director.

Euclid, Ohio

The city of Euclid, population 12,751, collects household garbage, using two 2-ton trucks for this service. The garbage is disposed of by incineration.—J. L. SULLIVAN, Superintendent of Streets.

Findlay, Ohio

In Findlay, population 19,363, a portion of the garbage is collected by the city and the remainder by private collectors paid by the householders. The city owns one Ford truck, which carries about 20 standard garbage cans. The garbage is disposed of by liming and burial.—M. LAFFEY, Acting Health Commissioner.

Fostoria, Ohio

The garbage of Fostoria, population 12,790, is collected by a contractor, who is paid by the fees he receives. The contractor uses one 2-ton motor truck with a 96 x 108-inch body. The garbage is disposed of by burial.—L. W. GIBSON, Health Commissioner.

Galion, Ohio

The garbage of Galion, population 7,674, is picked up by private collectors paid by the individual householders. No particular method of disposal is used, each collector disposing of it in the manner most convenient and practical for him.—K. A. POISTER, Director of Public Safety.

Marietta, Ohio

Individual private collectors paid by householders remove all of the garbage in Marietta, population 14,285. Practically all of it is disposed of by feeding to hogs.—W. S. EBERLE, Clerk, Board of Health.

Massillon, Ohio

The city of Massillon, population 26,400, collects garbage and rubbish with a fleet of three Ford A 4-cubic-yard trucks and one Ford special service pick-up truck. The garbage and rubbish is disposed of by incineration.—C. E. RICE, City Engineer.

Niles, Ohio

The individual householder in Niles, population 16,314, makes arrangements with a private collector for the removal of garbage and pays the charges. The collector uses a 1½-ton Ford dump truck with watertight body. The garbage is disposed of on a local dump.—R. W. BURNS, Sanitary Police and Plumbing Inspector.

Ravenna, Ohio

A private collector paid by the individual householder attends to the collection and disposal of garbage in Ravenna, population 8,019.—R. O. WHITACRE, Service Director.

Duncan, Okla.

The city of Duncan, population 8,363, contracts with one individual for the collection of the garbage throughout the city. The contractor uses four 7 x 14-foot wagons for collection and hauls the garbage to a local dump ground, where it is burned.—W. H. HOLLINGSWORTH, City Manager.

Astoria, Ore.

The garbage and rubbish of Astoria, population 10,349, is collected by private collectors paid by the individual householder. Some of the garbage is collected and fed to hogs, and the remainder of the garbage and the rubbish is disposed of on local dumps.—H. M. MCCALLISTER, Street Superintendent.

Oregon City, Ore.

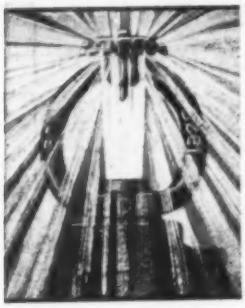
A private collector paid by the householders uses two 6-yard Fords in Oregon City, population 5,671, for the collection of garbage. It is disposed of partly by feeding to hogs and partly by burning on local dumps.—J. R. STAFFORD, City Engineer.

Carlisle, Pa.

The city of Carlisle, population 12,596, pays a single contractor to collect garbage throughout the city. The contractor uses one 2-ton truck for this service and disposes of the garbage by feeding to hogs.—MARY BITNER, Borough Clerk.

Ellwood City, Pa.

The city of Ellwood City, population 12,323, collects about 40 per cent of the garbage, using one 1-ton Ford with a 1-cubic-yard body. The garbage is disposed of by incineration.—LOWELL W. MONROE, Borough Manager.



EVERY SPRINKLER HEAD A FIRE DEPARTMENT NERVE AT N. Y., N. H. & HARTFORD R.R. SHOPS BOSTON, MASS.

Every one of the 8286 sprinkler heads in the Readville shops of The New York, New Haven & Hartford R. R. Company, at Boston, Mass., acts as a fire department nerve. When a sprinkler head operates for a fire, the plant fire brigade, and the Boston and Dedham municipal fire departments, receive an instant warning.

This is accomplished by means of the Gamewell SPRINKLER WATCHMAN—a master model municipal fire alarm box connecting the sprinkler system with the fire department. At the N.Y., N.H. & Hartford R.R. shops 12 SPRINKLER WATCHMEN are used to connect 8 wet and 2 dry sprinkler systems with the plant fire brigade, and two more are used to pass the alarms along to the Boston and Dedham municipal fire departments.

The Gamewell SPRINKLER WATCHMAN furnishes the most efficient, quickest and most economical form of sprinkler alarm service that is available today. It doubles the value of the sprinkler system to property owners and fire departments alike by making every sprinkler head a fire department nerve that will automatically "pull" a fire alarm box in addition to fighting a fire.

Our bulletin I. L. 302 explains the SPRINKLER WATCHMAN in detail—may we send you a copy?

Let Gamewell Fire Alarm Boxes Keep An Eye on the Sprinklered Property of Your City.

The Sprinkler Watchman

"It provides a very satisfactory means of bringing in a fire alarm in case of a fire near a sprinkler in an unattended building, which would undoubtedly save considerable damage in case the fire occurred at night, when there is no one around to ring in an alarm. Further, an alarm would be provided in case of false operation of sprinkler, resulting in investigation and shutting off of water before excessive damage resulted."

J. D. Rogers, Supt. of Communication
N. Y., N. H. & Hartford R. R. Company

THE GAMEWELL COMPANY
NEWTON, MASSACHUETTS

Fire—Police—Safety Items

of Interest to Departments of Public Safety

Fire Prevention Bureaus Widespread

THE extent to which city fire departments have added organized fire prevention activities to their regular duties is indicated in the latest issue of the National Fire Protection Association *Quarterly*. About a decade ago, it is stated, the sole function of the fire department was considered to be the extinguishment of such fires as occurred; now inspection work and various other activities designed to reduce the number of fires and the potentialities for destruction constitute a recognized duty in a large number of cities, and this is coming to be looked upon as of importance equal to the traditional aspects of fire fighting.

Cities in various population groups, with and without fire prevention bureaus, are given as follows:

Over 500,000. WITH: New York, Chicago, Philadelphia, Detroit, Los Angeles, Cleveland, Boston, Baltimore, San Francisco and Milwaukee. WITHOUT: St. Louis, Buffalo and Pittsburgh.

300,000 *to* 500,000. WITH: Minneapolis, Indianapolis, Rochester, Washington, New Orleans, Cincinnati, Newark, Seattle, Jersey City, Portland, Ore., Kansas City, Mo., and Louisville. WITHOUT: none.

200,000 *to* 300,000. WITH: Toledo, Memphis, Providence, Dayton, Houston, Columbus, Denver, Oakland, St. Paul, Atlanta, Dallas, Birmingham, San Antonio, Akron, Syracuse and Omaha. WITHOUT: none.

150,000 *to* 200,000. WITH: Richmond, Grand Rapids, Worcester, Oklahoma City, Youngstown, Hartford, New Haven, Fort Worth, Flint and Nashville. WITHOUT: none.

125,000 *to* 150,000. WITH: Springfield, Mass., San Diego, Bridgeport, Scranton, Long Beach, Calif., Tulsa, Yonkers, Norfolk, and Jacksonville. WITHOUT: Albany, N. Y., Paterson, N. J., Des Moines, Iowa, and Salt Lake City.

100,000 *to* 125,000. WITH: Trenton, Kansas City, Kans., Chattanooga, Spokane, Erie, Fort Wayne, New Bedford, Wichita, Miami, Tacoma, Wilmington, Del., Knoxville, Peoria, Somerville, Evansville, Utica, Lynn, El Paso, Duluth and Lowell. WITHOUT: Canton, Fall River, Elizabeth, Cambridge, Reading, Camden, South Bend, Tampa and Gary.

30,000 *to* 100,000. Many of the 217 cities in this group have fire prevention bureaus, among them, according to N. F. P. A. records, being: Montgomery, Ala.; Berkeley, Fresno, Pasadena and Sacramento, Calif.; Waterbury, Conn.; Augusta, Macon and Savannah, Ga.; Lexington, Ky.; Springfield and East St. Louis, Ill.; Terre Haute, Ind.; Brockton, Chelsea, Everett and Haverhill, Mass.; Saginaw, Mich.; Springfield and St. Joseph, Mo.; Hoboken and Passaic, N. J.; Binghamton, New Rochelle and Schenectady, N. Y.; Charleston and Columbia, S. C.; Superior, Wis.; and Manchester, N. H. Many other cities in this group, while not having fire prevention bureaus, have appointed a fire department officer to take charge of inspection work.

In commenting upon the variation in size and duties among the various bureaus it is stated: "The personnel of the fire prevention bureaus ranges from the one-man bureau in the small city to the New York bureau, which includes a chief, two deputy chiefs, 169 inspectors and 100 clerks. The excellent bureau in Los Angeles consists of a battalion chief, three captains, three clerks and 33 inspectors. The one in Milwaukee consists of a chief, a captain, a lieutenant and 18 inspectors. . .

"For the most part, the fire prevention bureaus throughout the country are organized along the lines set forth in the suggested ordinance establishing a bureau of fire prevention recommended by the N. F. P. A. and the National Board of Fire Underwriters. There are still a considerable number of bureaus, however, that do not have the benefit of specific ordinances defining their powers and duties and that are compelled to operate entirely by persuasion. The experience of nearly all of the successful bureaus has demonstrated the importance of proper public relations and the desirability of tact in dealing with the public, but the bureaus all recognize the necessity of having the proper power through ordinances to take care of the exceptional cases where legal authority is needed to correct a condition."

Fire Losses for 1930 and 1931

THE preliminary estimate of fire losses in the United States, during 1931, given in THE AMERICAN CITY for February, 1932, at page 17, is made slightly less by the announcement of the December, 1931, figures by the National Board of Fire Underwriters. December had previously been estimated. The new total is $452,017,026, as against the earlier figure of $453,500,000.

The final total of the Actuarial Bureau of the Board for 1930 fire losses, superseding previous estimates, is $501,980,623.

Accident Repeaters Analyzed in Pittsburgh

CITY and state accident records covering about 19,000 drivers involved in 12,000 accidents in Pittsburgh during the years 1928 to 1931 inclusive have recently been analyzed by the Pittsburgh Bureau of Traffic Planning under the direction of Lewis W. McIntyre, Traffic Engineer, to determine the extent to which repeaters contribute to the accident total.

During this period, 371 drivers were found to be involved in two or more accidents, the total of such accidents being 773. Thus, repeaters constituted less than two per cent of the drivers involved in accidents, yet these contributed to the occurrence of 6.4 per cent of all reported accidents.

Three hundred forty-four drivers were involved in two accidents, 25 in three accidents and two in five accidents. Of the 27 drivers in three or more accidents, 15 were found to be deficient in safe driving knowledge, while the remaining drivers appeared to have been involved in accidents through no fault of their own.

A similar analysis of a report of the Traffic Observers organization was made. This is a body consisting of 500 citizens, sponsored by the Mayor's Better Traffic Committee, who report serious traffic law violations which they may observe. In the period May 15, 1930, to December 31, 1931, 5,667 reports were received covering 6,599 traffic violations.

Fifty-six repeaters were reported 119 times; or about one per cent of all drivers reported were responsible for slightly less than two per cent of the reports received.

Fifty repeaters were reported two times; five, three times; and one, five times. Investigation of the accident records showed that five of the repeaters had been involved in accidents. Four of these were reported twice by observers and had one accident each. The remaining repeater was reported three times and was involved in three accidents. The report states: "It is especially significant that the types of violations for which these repeaters are reported are usually the causes of the types of accidents in which they were involved. No definite conclusion can, however, be made, on account of the small number of repeaters with accidents, but further investigation seems warranted."

It should be noted that the percentage of accident repeaters found in this survey is less than half that found in similar studies in Connecticut and Massachusetts. The difference may be attributed to variations in the quality—that is the completeness—of reporting, which doubtless exist in different jurisdictions.

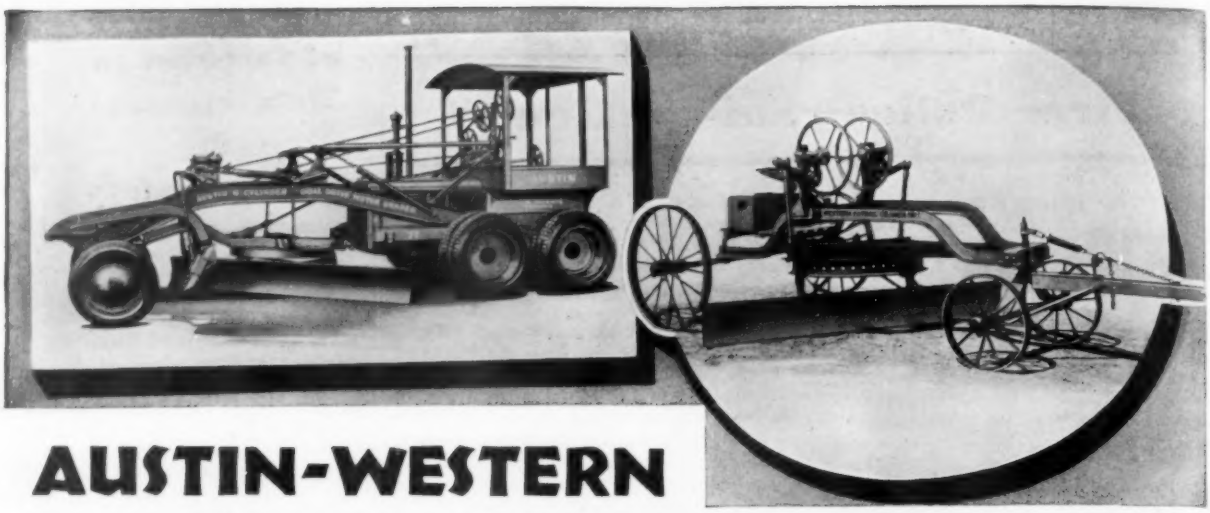
A National Police Force?

To the Editor of THE AMERICAN CITY:

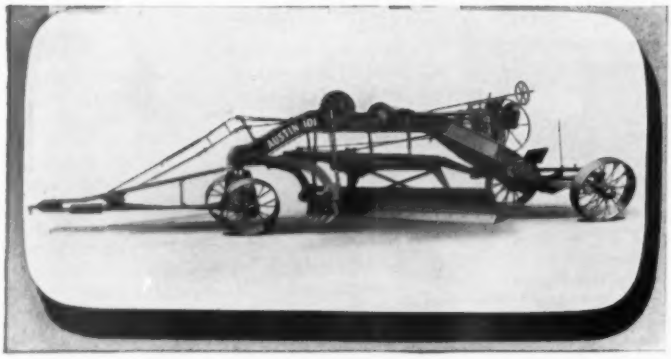
I would like to see printed in your excellent magazine, arguments pro and con a national police force, under which system every police officer in the United States would belong to one national organization, entirely divorced from politics, each political district to have as many highly skilled men as it requires and cares to pay for, whose duties are only to see that the laws of such community are upheld; the men to be shifted about the country occasionally to prevent political hook-ups; all states to waive extradition in criminal cases; no separate park, city, village, county or state police and no political boundaries to prevent the officer from "getting his man."

I have just read in your last issue that New Jersey has 348 separate and independent police departments; when will the people of this country wake up and stop such terrible waste of their money?

Chicago, Ill. R. Y. PEARSON.



AUSTIN-WESTERN
GRADERS WILL FILL YOUR REQUIREMENTS!



Austin-Western sells it—graders for road maintenance, graders for construction, horse drawn patrols, planers, light blade graders, heavy blade graders, motor graders with single, tandem and full-dual drives, graders of every type, graders for every job!

The Austin-Western Line is complete (a few models are illustrated), offering a size and type to meet every demand, with accessories and attachments to suit every operating requirement.

Austin-Western should be your buying source for road building and maintenance, rock crushing and earth handling equipments, for maximum service, and a faster, better finished job must result from the use of properly designed, inter-related machines.

The Austin-Western Line includes many models of
CRUSHING and SCREENING PLANTS
SWEEPERS and SPRINKLERS
ROAD ROLLERS • BITUMINOUS DISTRIBUTORS
CULVERTS • ROAD DRAGS
BLADE GRADERS • MOTOR GRADERS
ELEVATING GRADERS • PLOWS and SCRAPERS
CRAWLER SHOVELS
CRANES and DRAGLINES
CRAWLER and DRUM WHEEL WAGONS
ROOTERS, SCARIFIERS and MISCELLANEOUS
SMALL TOOLS

Mechanical refinements, dictated by seventy-four years of specialization, provide correct operation, even by unskilled operators; in-built ruggedness assures a full measure of service; warehouse stocks in twenty-seven cities assure prompt delivery—these are added reasons for you choosing an Austin-Western Grader.

Investigate the Austin-Western Line first—get first hand data from our sales engineers—get the facts and then make your comparisons. Unit for unit Austin-Western machines are better built for harder service, rougher handling AND longer life. A call for a sales engineer implies no obligation. Bulletins on one type of grader or the complete Austin-Western Line, too, are gratis—write for copies today!

The Austin-Western Road Machinery Co., 400 North Michigan Ave., Chicago, Ill.

337

The Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, ROAD OILERS, ROAD DRAGS, CULVERTS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

JUNE, 1932

Vol. XLVI, No. 6

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Economists Warn Against Brutal and Blind Retrenchment of Public Spending

From an address by Virgil Jordan, at the 1932 annual banquet of the Pennsylvania State Chamber of Commerce:

NO highly developed industrial nation can escape increased public spending as a means of diverting excessive savings from production of competitive products into social services, which not only expands current purchasing power for products of established private business but raises the general standard of living. Such public expenditure supported by public credit is especially important in periods of depression. Yet the country is now being swept by a fiscal hysteria in which public officials are vying with each other for glory by blind slashing of expenditures for public projects, increasing relief burdens by throwing thousands out of employment and thereby drying up the taxable resources of the community in a vicious circle.

It is true that this situation is the result of long-standing defects in the structure of local taxation and evils and inefficiencies in public administration which constitute one of our major problems for the future. But only business recovery can afford an opportunity to tackle them intelligently, and such recovery is being delayed and hampered by this brutal and blind policy of retrenchment. We deceive ourselves if we imagine that public credit can be improved by any such policy. I can suggest no immediate solution for the impasse it presents, but I say with all emphasis that the deflationist policy which dictates it is disastrous and fallacious.

At this time, above all, when private spending is at its lowest, is the time to expand public spending. Just as we saved our way into depression, we must squander ourselves out of it. Economy, public and private, is a policy perfectly adapted to a depression due to insufficiency or famine, but it is folly to apply it to a depression due to a surplus of everything. There is in fact no escape from increased public spending in depression, anyway, since unemployment relief cannot be refused. It is far better to spend it for public improvements of permanent value. Abandoning such projects and supporting the unemployed is merely pumping water over the boat and getting nothing for one's money.

From an address by William T. Foster, at a special meeting of the Taylor Society:

THE goal is now clear and the path is clear. We must conquer the depression by collective action. This necessarily means the leadership of the Federal Government—the only agency which represents all of us; the only agency with power enough to use our resources. We must abandon our policy of defeatism, our worship of the budget, our false economy programs, our complete reliance on individual initiative. Instead, we must collectively put into use enough currency and credit to restore the commodity price level of 1928. This degree of counter-deflation would automatically relieve all debtor nations, all debtor farmers, all debtor home-owners, all debtors of any class, of unjust and intolerable burdens caused by the deflation of the past three years; enable tens of thousands of business concerns again to operate at a profit; avert labor troubles by reducing real wages without reducing wage rates; bring money out of hoarding without any ballyhoo campaigns; restore the values of bank assets and for the present virtually stop bank failures; give the unemployed what they want— jobs, not charity; increase the volume of production by at least 20 per cent, which is the only way to restore the taxable capacity of the nation. Thus, in one process, we could increase the national debt and reduce the *burden* of the national debt.

From Letters to Senator Robert F. Wagner, of New York, Published in the Congressional Record for May 16, 1932

From Edwin R. A. Seligman, Professor Emeritus, Department of Economics, Columbia University:

I HAVE always felt that we should treat this emergency of peace very much as we treat the emergency of war, and that we should be perfectly justified in issuing a large emergency peace loan, as we did a Liberty war loan. . . .

"The time has come, in my opinion, for some constructive efforts on a really large scale. What has thus far been done in Washington is in the nature of a palliative. I think we are ready now for something positive, and we must not forget the great dangers of inaction and further drifting. . . . We do need at Washington a great deal more constructive and forward-looking thinking than has yet been manifest.

Professor William M. Leiserson, Department of Economics, Antioch College, Yellow Springs, Ohio:

THAT private construction and employment in private industries are not likely to expand soon without some stimulation from an expanded program of public works construction is evident by the steady drop in employment and payrolls during the last two years. Private business, in order to meet the problems of the depression, is compelled to curtail operations, to lay off workers and to reduce payrolls. This intensifies the depression and the most important counteracting influence (aside from an inflation of currency) is an expanded program of necessary public works. Such a program would not only stimulate recovery, but it would leave the country with necessary productive wealth to show for the expenditure of funds; where an inflation policy, which is the alternative method of bringing recovery, may result in increasing the capacity of private industries that are already overdeveloped.

As to bond issues to finance public works of long-time duration, there can be no justifiable objection to such a method of financing. The notion that it would divert funds from private employment is absurd because the main reason for the present unemployment is that private industry is not in a position to use the available capital. There is no lack of funds, but private industry cannot use them profitably. The Government, however, could use them most profitably on necessary and productive public works.

From Edward Berman, University of Illinois, Urbana:

BALANCING the budget is important enough; but if it is to be accomplished by methods which intensify the depression, it becomes more and more difficult each year. Balancing the budget was certainly not regarded as a serious need when we were engaged in the World War. Our economic situation today is tremendously more serious than that which we faced during the war. If we could borrow many billions to fight such a war, it seems strange that we should regard it as unsound to borrow much less to help win the fight against depression.

From Professor John B. Canning, Department of Economics, Stanford University:

THE immediate relief of unemployment is, in my opinion, much more important than the money economy to the taxpayer. The consequences of long unemployment or underemployment cannot wholly be measured in money values. The direct, physiological injuries of undernutrition, bad housing, lack of medical care, etc., and the arresting of educational programs consequent upon reduced money income can never be remedied at all by a subsequent return of prosperity. We can arrest the evil; we cannot cure the damage already done.

As decent citizens and human beings we have a duty to arrest these irremedial evils of unemployment, and the emergency is so critical that the Federal legislature and administration cannot be excused for leaving the matter to state and local action, even though local relief action might conceivably be better. We know, to a downright certainty, that state and local action has been, and will be, inadequate.

From W. N. Loucks, University of Pennsylvania, Philadelphia:

THE argument that the Government should balance the budget and should cease borrowing is fallacious for the following reason (among others): Included in the Government budget are certain capital outlays. No business concern tries to meet capital outlays from receipts of the year during which the capital outlays occur. It is possible to make out a case for balancing the budget in the sense of having current operating expenditures covered by current revenue receipts, but there is no logic and no business practice which requires that a budget including capital outlays should be met by current revenue receipts.

From Sumner H. Slichter, Graduate School of Business Administration, George F. Baker Foundation, Harvard University:

YOU ask whether a bond issue to expand public works would divert funds from private industry. Such a bond issue would probably create funds for private industry. The tight credit situation which exists in many communities today is not the result of heavy borrowing; it is a result of heavy withdrawals of funds from the banks. As business improves and as confidence, particularly confidence in the banks, is restored, funds will flow back and credit will become easier. The best way to restore confidence is to give business more orders and hence the chance to make greater profits. The theory that public borrowing would divert funds from private industry overlooks the fact that the money borrowed by the Government would be used to buy goods and hence would increase orders and profits.

From Spurgeon Bell, Director, The Ohio State University, Columbus:

I SHOULD like very much to see the Government encourage also the organization of some limited dividend corporations in the construction industry with the view of promoting large-scale operations to furnish inexpensive living quarters for the working population who will not, in the ordinary course of events, be in a position to own their homes.

Public Authorities Must Clear the Slums, If Business Does Not Act

From the Foreword by Dr. Ray Lyman Wilbur to Volume III —"Slums, Large-Scale Housing and Decentralization"— of the publications of the President's Conference on Home Building and Home Ownership:*

TO those who look upon government operations in the field of housing construction with abhorrence, the challenge is definitely offered by the Committees on Large-Scale Operations and Blighted Areas and Slums. If business, financial and industrial groups fail to take the task in hand and apply the large sums of capital required and the utmost of planning genius and engineering skill to the problem, it seems likely that American cities will be forced to turn to European methods of solution of this problem, through subsidization by state and municipal treasuries and probably through actual ownership and operation of housing projects by municipal authority. It can hardly be doubted that the next ten years will determine which choice will be made between these alternatives if business men forfeit their opportunity. Unless business men and business groups accept the challenge, housing by public authority is inevitable. There is no compromise—no timid or partial solution.

From the Introduction to the same Volume by Dr. John M. Gries and Dr. James Ford:

SLUMS cost money. They are the most expensive form of housing known, and it is the community that pays for them. There has been too little appreciation of this fact, too general a tendency to regard slums as problems solely for the sociologist and the philanthropist. It is no gesture of charity to better the standards of housing of our poorer neighbors, for we all pay cash—in taxes for utilities and for police and fire protection, in the high cost of fire insurance, in the depreciation of adjoining property values, and in social welfare work—for low standards of housing in any part of the community. However great the cost of wiping out slums, it is not so great as the cost of maintaining them. . . . .

The concept of large-scale operations in home building is a product of the modern realization that housing is both a complex problem demanding resources and technical qualifications that no individual alone can supply, and a community problem demanding the action of public authorities.

* See Department of Municipal and Civic Publications of this issue.

Water and Light Plants— The Advantages of Combined Operation

By **JAMES D. DONOVAN**
Manager of Production and Distribution, Board of Public Utilities, Kansas City, Kan.

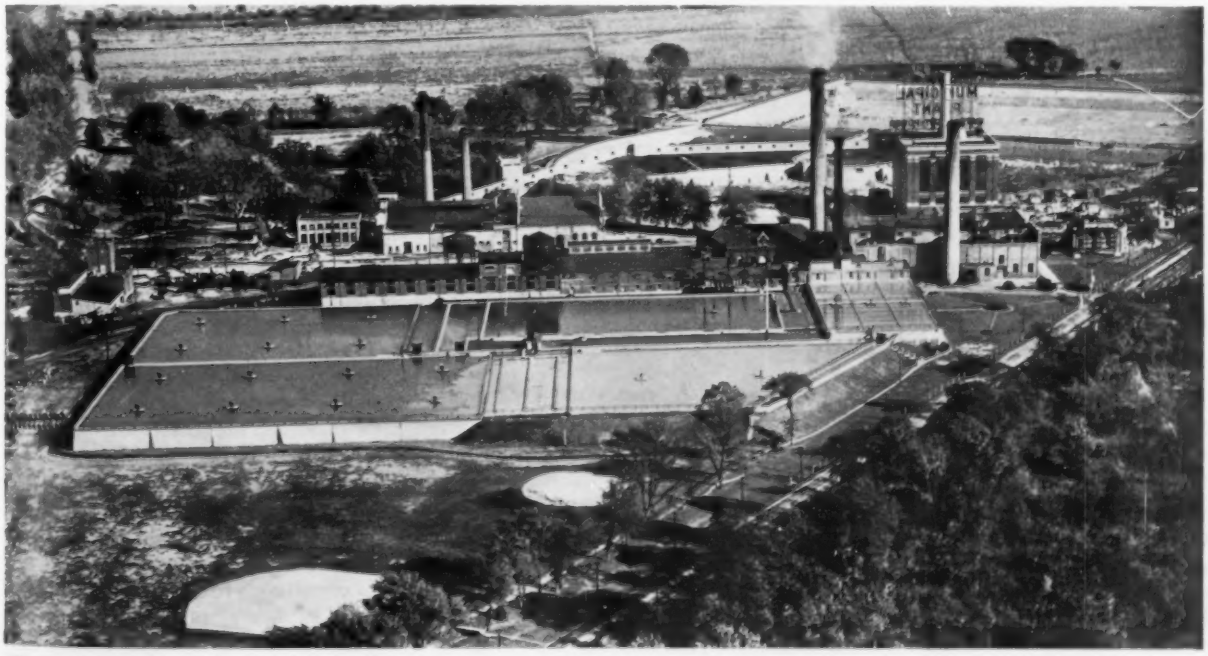
CUSTOM or legislative enactments have placed upon the governing body of the modern American city full responsibility for the proper protection of the health, life and property of its inhabitants, and in carrying out this obligation it is doubtful whether there is anything more important or more essential than an abundant supply of pure and wholesome water.

In performing this function, the governing bodies of many municipalities have found it expedient, economical, or absolutely necessary, to act in their proprietary capacity, and to purchase or construct, operate and maintain their own systems of water supply. Not so many years ago the business of furnishing a supply of water in most American cities was intrusted to private capital and treated as an ordinary public utility venture operating under franchise. There are still a number of cities obtaining their public water supply in this manner, but in general municipal water departments are today almost as common in the American city as municipal fire and police departments.

Investment Value of Water Works

As a concrete example of the value of an investment in water-works systems when compared with other types of public utility investments, we may study the situation in Kansas City, Kan. The city owns and operates an electric plant serving some 33,000 customers, and a water plant serving 28,000 customers. At the close of business December 31, 1930 (which gives the last annual figures available) the electric plant represented a total investment of $4,468,313.40, and the water plant a total investment of $5,448,090.76. For the year 1930 the gross income of the electric plant was $1,855,815.98, while the gross earnings of the water plant were only $961,199.36. For this same period the net earnings of the electric plant before allowing for interest, depreciation and sinking-fund requirements, were $861,307.45, while the net earnings of the water plant were only $530,650.66. The amount required for interest and sinking-fund in the electric plant was $263,758.78, and in the water plant $328,084.06.

Here are two public utility plants operating in the same city and serving approximately the same number of customers, one of which, the electric plant, offers to the investor earning power equal to 3¼ times dividend requirements, while the other, the water plant, offers to the investor a return of only 1 2/3 times the dividend requirements. Lest you might draw an erroneous conclusion from these figures and assume that the electric rate must be too high, permit me to state that the average return from all the electric energy generated during the year 1930 was only



Photograph by Curtiss-Wright Flying Service, Inc.

AN AIRPLANE VIEW OF THE ENTIRE WATER AND LIGHT PROPERTY LOOKING EAST

In the foreground is a large baseball diamond, immediately back of which are the settling basins. The buildings in back of the settling basins are filter plant, boiler house and pump rooms, the large building in the upper right-hand corner supporting the electric sign being the addition to the electric plant recently constructed

EXTERIOR VIEW OF RIVER PUMP HOUSE AND INTAKE WELL IN THE MISSOURI RIVER

The pumps furnish water for condensers in the electric light plant and for the settling basins of the water plant, this being one of the outstanding points of advantage in combined operation of water and electric plants as they occur in Kansas City, Kans.

INTERIOR VIEW OF THE RIVER PUMP HOUSE

Showing the three 30,000,000-gallon motor-driven centrifugal pumping units

1.82 cents per kilowatt-hour, which is a net return considerably below the average for electric plants of comparable size and volume of business.

The shrewd investor is interested in only one thing aside from the security of his investment, and that is how fast he can turn his dollar to increase its earning power; and from this example it must be obvious why private operating companies are, as a rule, willing to permit a municipality to conduct a water plant business.

The Electric Utility Franchise

In a relatively short time the application of electricity has become so diversified and its use has increased to such an extent that the activities of the city of today would be practically paralyzed without it. Among the many uses to which electric power can be economically applied is that of pumping water, hence it seems strange to me that a city which owns and operates its water plant should delegate to a private corporation, by franchise, the right to use its streets and alleys for the purpose of transmitting electric light and power and then in turn become in many cases the largest customer of the corporation through the purchase of electric energy for water pumping, the lighting of its streets, the control of traffic, the operation of public buildings and many other governmental purposes, particularly when so many economies can be effected through the joint operation of electric plants and water plants.

Economies in Combining Water and Electric Utilities

There are two points of view in the discussion of the economies effected through the combined operation of water and electric plants by a municipality, one of which has to do with the total cost of service to the customer, and the other with the economies effected through joint operation in construction, management and operation of such plants. Inasmuch as the former is usually a resultant of the economies obtained from the latter, it is my intention to confine the following discussion to the construction and management features only.

Investment in Property

The primary advantage of combined operation of water and electric plants is the matter of investment required in certain of the physical properties such as land and buildings, as well as the minor investment in certain forms of auxiliary apparatus together with tools and miscellaneous equipment. For instance, in Kansas City, Kan., there is a water intake well located within the harbor line of the Missouri River having a capacity of approximately 100 million gallons a day. This well is fitted with revolving trash screens and serves the purpose of supplying water to low-pressure pumps for the settling basins of the water plant, as well as circulating water for condensing purposes on the turbo-generating units of the electric plant. Adjacent to this intake well is the low-pressure pumping station having a total installed capacity of motor-driven centrifugal units of some 90 million gallons per day. Both of these investments are used jointly by the water and electric plants, and except for the installed capacity of pumping equipment would amount to substantially the same total investment were either plant to be operated separately, hence a substantial saving in fixed charges to both plants is effected through this combination.

Leading from this low-pressure pumping station to the settling basins are two discharge mains that pass first through the generating room of the electric plant and thence to the settling basins, and they are so placed and interconnected that either main can be used on any one of five electric generating units, the final discharge of water being made either in the settling basins or wasted back to the river, as load conditions may require. This flexibility of piping arrangement would be unnecessary were water delivered from the low-service pumping station to the settling basins for water department use only, but inasmuch as the investment necessary for this flexibility is provided by the electric plant and the major portion would have to be provided whether operated in conjunction with the water plant or otherwise, this piping arrangement does not in any way affect the ultimate investment of the water plant. Of course, some additional head is encountered because of increased friction in pumping water from the river through the more circuituous route required to serve the electric plant, and a further additional head of approximately 10 feet is encountered through the normal friction of the surface condensers, but this difference in pumping head is absorbed by the electric plant in the proration of pumping cost between the two plants and hence does not effect any increase to the water plant.

The advantages of this arrangement are limited to the balance of requirements for water in the settling basins of the water plant as compared with the requirements of water for condensing purposes in the electric plant; that is, up to a point where the water required by the electric plant for condenser purposes does not exceed the amount required by the water plant for its particular purposes, the maximum of economy through this arrangement is obtained. After this point is reached, however, and the requirements for condensing water in the electric plant exceed the requirements of the water plant for water, this advantage commences to disappear and would eventually be lost altogether if the differenc in water requirements of the two plants becomes great enough, because it is obvious that it would be expensive to pump excessive quantities of water at the higher head occurring through combined operation. However, when this point is reached, if ever, it is possible to still retain the major portion of these economies by interconnecting certain of the electric generating units in such a manner that only such capacity will be served in combined operation as will be justified by the needs of the water plant for water. The rest of the electric generating units could then be served through lower heads in connection with tailing pipes for river return.

The Condenser Problem

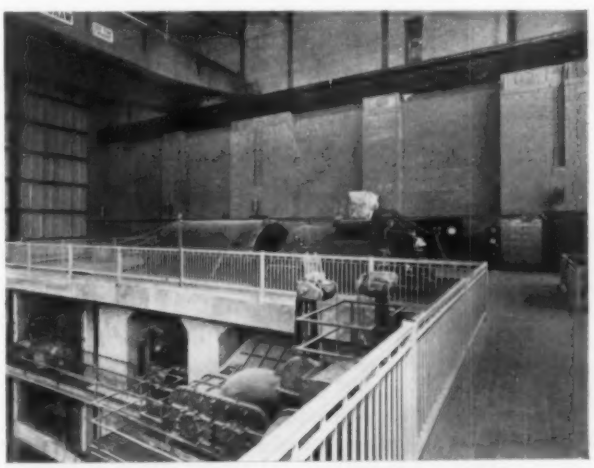
In the design of condenser equipment for the electric generating units at the Kansas City, Kan., electric plant, we have always specified a maximum water temperature existing in the Missouri River during the summer period, of 80° Fahrenheit. During the past summer, because of the extremely low stage of the Missouri River, the temperature rose to 87°. This condition, together with the relatively low steam pressure and superheat of the station and their resultant effect on the steam consumption of electric generating units, makes it necessary for us to have approximately 2 square feet of condenser surface for each kilowatt of electric generator rating; and with 80° circulating water it is necessary to have approximately 0.9-gallon per minute per square foot of condenser surface, or 1.8 gallons per minute per kilowatt of electric generator capacity, to obtain proper conditions at the exhaust nozzle of the turbine. At the present time our normal peak load is 20,000 kilowatts, requiring circulating water for the condensers at the rate of 36,000 gallons per minute. The load factor, however, on the electric plant is such that the average requirement for condenser water represents only 60 per cent of this amount, or approximately 21,000 gallons per minute, which is slightly in excess of the present average requirements of the water plant for water. This means that during times of peak load on the electric plant we are forced to waste a certain per cent of condenser circulating water back to the river, which is the portion not required by the water plant, and this waste is of water which has been pumped at a head substantially higher than would be required for the electric plant only.

I do not mean to leave the impression from the foregoing that this condition of operation has as yet reached a point that would be considered wasteful, because the figures previously set out covered circulating water requirements under conditions of high river water temperature, and since the peak loads on the electric plant and water plant are not coincident, the waste of water during periods of peak load in the electric plant, which occur during the fall and winter months, is not very great, because of the lower temperature of the river water during this period, which reduces the quantity required. In the warm period of the year the load on the electric plant is relatively lower and the volume of water required by the water plant is relatively greater, and this condition permits the average result to still be entirely satisfactory.

The passing of this low-pressure water through the surface condensers of the electric generating units has an advantage to a water plant using open settling basins, particularly during the winter season, due to the fact that the temperature of the water is increased enough to prevent the formation of ice on the settling basins, and this increase in temperature also aids materially in the reaction of chemicals applied for settling and treating purposes. During the warmer period of the year, however, this condition of the water appears as a disadvantage due to raising the temperature of the distributed water to a point higher than that of the river water, the ordinary increase in temperature caused from passing water through the surface condensers being between 10 and 15 degrees. Of

INTERIOR VIEW OF THE NORTH END OF THE FILTER PLANT BUILDING

Showing the rapid sand filters and, along the left central part of the picture, the operating tables which contain the control valves. This filter plant has a total daily capacity under normal filtration rates of slightly over 25,000,000 gallons per day



A VIEW OF THE 10,000-KILOWATT TURBO-GENERATING UNIT IN THE NEW ELECTRIC PLANT ADDITION

The 100-ton traveling crane is shown in the upper left-hand corner

course a certain amount of this added temperature is again radiated in the settling basins, and there is a further radiation from underground service pipes before the finished water actually reaches the customer, and unless the service is in very close proximity to one of the main flow lines there is little possibility of any complaint from this source.

The foregoing advantages of combined operation of water and electric plants would not be reflected to this extent in small steam plants where the water supply is obtained from wells, nor would it be reflected in small electric plants operated with diesel engines. However, these two types of plants would gain material benefit from combined operation by the use of single building units and much auxiliary equipment, but the extent of the advantages would depend somewhat on local conditions.

Electrically Driven Equipment

Combined operation of water and electric facilities in almost any type of plant permits the economical use of a considerable amount of electrically driven pumping equipment that would not usually prevail in separately operated units. The first investment in motor-driven pumping units is far below that required for any other type of pumping unit, and where they can be installed in duplicate and in close proximity to a generating station with complete duplication of service lines, they are as dependable as any other type of pumping equipment. In Kansas City, Kan., the high-pressure pumping equipment consists of two 12½-million-gallon cross-compound, condensing, crank and flywheel type pumping engine and one 25-million-gallon synchronous motor-driven two-stage centrifugal pump, and in the pumping of high-pressure water by these units we again have the advantage of joint investment. This particular division of the water plant proper is operated on a customer basis with the electric plant; that is, the electric plant furnishes to the water plant either steam for the operation of the high-pressure steam pumping equipment or electric energy for the operation of the high-pressure motor-driven equipment. Certain investments held jointly by the two plants are taken into consideration when fixing the rates charged for either steam or electric energy to the water plant. The boiler plant building, for instance, houses equipment owned jointly by the two plants, and this is served by a common set of coal- and ash-handling equipment and other auxiliary apparatus. Likewise, the main engine room houses high-pressure water pumping equipment as well as electric generating equipment and is served jointly by the same crane and other common facilities, and it is evident that if either plant were operated separately they would be required to support individually, though in a smaller way, these points of common investment, which would naturally reflect some increase in their fixed operating expense.

In the Kansas City, Kan., plant the 25-million-gallon synchronous motor-driven unit is operated as much of the time as possible. In fact, with the single exception of a burn-out in the motor requiring rather extensive repairs, this pumping unit has been in continuous service for the past nine years, being down less than forty-eight hours total per year for inspection and checking. Our reason for operating this unit continuously would not be parallel to what may be found in other pumping stations, but to us it means a substantial saving in operating expenses through the saving of packing, pump valves, lubricating oil and other miscellaneous materials used in the operation of the crank and flywheel type of pumping units. The present developments in steam turbine-driven centrifugal pumping units would not offer by any means the same comparison of economy as prevails in the Kansas City, Kan., station, but, on the other hand, where the prime movers in the electric plant are of a type or sufficiently large to permit design having low steam or fuel consumption per kilowatt-hour, the ultimate duty obtained from a synchronous motor-driven unit is substantially the same as can be obtained from a steam turbine-driven unit of the same size and under the same conditions. A 2,000-hp. motor is used on this high-pressure centrifugal pump, and it has been especially designed for power factor correction. It is this feature in its continuous operation with the electric plant that enables the electric plant to furnish electric energy to the water plant at a low rate, because the electric plant benefits very materially through the operation of this motor in power factor correction on the station bus bars; excitation losses on the electric generating unit are thus reduced to a minimum and generator capacity is maintained at a maximum with decidedly improved regulation.

It is possible for us to operate in this manner without violating any requirements or suffering any penalties from the National Board of Fire Underwriters, because the boiler plant is always under pressure serving the steam requirements of the electric plant, and should electrical outage occur, the steam pumping equipment is ready to move in a moment's notice, from steam supplied through the same source. Hence, continuous operation of the electrically driven water pumping equipment is not burdened with any standby boiler expense, the only cost to the water department when operating with steam being that which it is charged on a per thousand pounds basis.

Saving in Operating Personnel

Another point of advantage in the combined operation of water and electric plants applies generally to all combined installations and has to do particularly with the matter of administration, superintendence, operation and maintenance of the equipment of both plants. For instance, in the Kansas City, Kan., plant, there is but one chief engineer of the power station, who has complete supervision over both the water and electric plants, and there is but one operating engineer on each shift, who in turn supervises the operation of both plants during his time on duty. Among the remaining members of the routine operating crews many instances occur where employees such as firemen, helpers, coal and ash men, oilers, etc., divide their time between both plants, thus aiding materially in the reduction of operating costs in each plant. This feature of combined operation is reflected in numerous plants. In many instances the superintendent of the water and electric plant even has some other municipal duties such as city engineer, or superintendent of a gas plant, or, as in one instance to my personal knowledge, city manager, all of which has a definite bearing on the total cost of the administration of municipal government.

Maintenance Charges Reduced

In the matter of maintenance, the advantage of joint operation is again reflected in the fact that the same mechanics can repair and maintain equipment of both plants, and while it is true that the combined operation requires

possibly a somewhat larger number of men, it is also true that were the plants to be separated it would not be possible to diminish the crews by one-half, and it is our experience that joint maintenance results in very substantial savings to both plants.

Common Labor

Owing to the wide diversity in the character of the work performed in the distribution of water and electricity throughout a city, it is not possible, in a large city at least, to effect very great economies through combined operation, although there are some few points of common interest involving the use particularly of unskilled labor that permit these departments to function somewhat more efficiently than if they were controlled and operated by separate maintenance organizations. In smaller municipalities not involved with labor agreements it is possible to get much more benefit from combined operation of distribution systems because jurisdictional arguments customarily found in larger centers of population are not encountered.

A Common Warehouse and Stock Yard

There is considerable advantage in the operation and maintenance of a common warehouse and storeyard at which materials are received and disbursed for the use of either the water or the electric plant. The storeyard can be supervised and operated by a single crew, and, were the two plants to be separated, it is doubtful whether over one-third of the help could be dispensed with, because so much of the work involved in such a department is strictly routine and the excess is only measurable in the increased quantity of materials to be handled through joint operation.

Accounting and Billing

A material saving is effected through joint operation in the major administration features as well as the billing and accounting departments. For instance, in Kansas City, Kan., there is one manager of production and distribution, who is responsible for the production and distribution of both water and electricity. There is also one Manager of Collections and Accounts, who is responsible for the collection and accounting features of both plants. While the state law, very properly, I think, provides that separate sets of books and accounts must be maintained for the water and the electric plant, this does not mean that it is necessary to have a duplication of accountants; hence in Kansas City, Kan., one auditor supervises both sets of books, one cashier supervises the collections of both departments, and one chief clerk supervises the billing of both departments, and it is obvious that, were the plants to be separated, practically all these positions would be filled for each plant separately.

Meter Reading

In the matter of meter reading there is further economy due to the fact that a great percentage of our customers have both water and electric service and the meter readers are required to read both water and electric meters. While it may take somewhat longer to read two meters on the premises of one customer, it certainly does not take twice as long, hence a substantial saving is made in this respect. The same general comments follow throughout the service and trouble departments of both plants, where duplication of employees is obviated through combined operation.

Rates and Costs

Water rates in Kansas City, Kan., range from 25 cents per 100 cubic feet, with a $1.00 minimum for the small user, to as low as 6 cents per 100 cubic feet for consumers using more than 400,000 cubic feet of water per month. Considering the fact that these rates cover the treatment, filtration and distribution of the very difficult water encountered in the Missouri River, they are, all things considered, extremely low.

In the electric plant the average rate paid by all domestic customers during the past year was 3.7 cents per kilowatt-hour; the average rate paid by all commercial customers was 3.7 cents per kilowatt-hour; and the average rate paid by industrial power users was slightly over 1 cent per kilowatt-hour, although several of the larger power users have earned rates for the year substantially under 1 cent per kilowatt-hour.

The average cost of pumping and distributing water for the year was 11 cents per 1,000 gallons, this figure including interest on outstanding bonds as well as depreciation at the rate of 2¾ per cent on the book value of the property. The cost of producing and distributing electric energy during the past year has averaged approximately 1.45 cents per kilowatt-hour, and these production costs cover all items of expense, including interest on outstanding bonds as well as depreciation at an amount equal to 6 per cent of the book value of the entire property.

It has been conservatively estimated that were these two plants to be separated and operated under the prevailing conditions of load and equipment by separate operating organizations, the cost of producing and distributing electric energy would be increased by not less than 25 per cent, and the cost of pumping and distributing water would be increased by as much as 40 per cent.

Administrative Policy

It is not the writer's contention that the foregoing statements cover all the advantages to be gained through joint operation of water and electric plants, nor that all the points mentioned are applicable to every plant. Generally speaking, however, it must be evident that many advantages of economical operation accrue through the joint operation of such utilities, and unless there are some extraordinary limiting physical conditions in a particular plant, these advantages greatly outweigh any disadvantages that may arise through such operation.

Since April, 1929, the water and electric plants in Kansas City, Kan., have been controlled by a Board of Public Utilities, five business men elected by the city at large, for terms of four years, and serving at an annual salary of $100 each. The Board employs two managers, one for production and distribution, and one for collections and accounts, and these two managers direct the details of both water and electric plants.

Shortly after the organization of the Board of Public Utilities, the Board employed the firm of Burns & McDonnell, consulting engineers, Kansas City, Mo., to survey both plants and submit to it a program of development covering some extended period in the future. As a result of this survey, there is now nearing completion at the plant the first unit of what will eventually be a 100,000-kilowatt

generating station. This initial installation is being made at a cost of approximately $1,600,000 and is being paid for entirely from the revenues of the electric plant and without the issuance of any bonds.

The new unit consists essentially of a boiler house large enough to contain two boilers, each having a normal capacity of 150,000 pounds of steam per hour, one being installed at the present time and one to be added during the course of the coming year. The boilers will operate at a pressure of 450 pounds with 250° Fahrenheit superheat, and are complete with economizers, air preheaters and water wall furnace. Firing is with pulverized fuel, using the unit system, and boiler control is completely automatic on what is known as the air-flow—steam-flow basis. The generator room will contain a 12,500-kva. generating unit in the initial installation. Future installations will be 30,000 kilowatts in capacity. The generator room is served with a 100-ton crane and is designed in size and proportion for the larger type units to be installed at a later date when their need is required. Circulating water for the condenser will be obtained in this plant on the same general basis as in the present plant, and in the construction of this initial unit there have been installed (based on future requirements) two 60-inch cast iron low-pressure flow lines, which are at the present time connected with the old source of low-pressure supply but which will be later extended individually to the intake well.

The new building and equipment are being erected on new land acquired during the past year adjacent to the older generating station, the land having been used by the Kansas City, Mo., Water Department as its low-pressure service intake for the Kansas City, Mo., water supply. In addition to the land, reservoirs and buildings, certain usable equipment was acquired, principal among which was one 50-million-gallon turbine-driven low-pressure pumping unit and a concrete and brick intake well in the Missouri River just below the old intake well of the Kansas plant. Both of these units of this acquired equipment have been rehabilitated and are now interconnected into the low-pressure water system of the Kansas City, Kan., plant and give to the plant an enormous reserve of capacity on an exceedingly small outlay of money.

ACKNOWLEDGMENT.—From a paper read before the Missouri Valley Section of the American Water Works Association.

Many Cities Have Ample Borrowing Margins for Public Works

LAST month's statement by William P. Capes that the 60 cities of New York State have a combined borrowing margin of over $800,000,000 has aroused much interest as to what a similar survey of other states would disclose. Inquiries addressed by THE AMERICAN CITY to leagues of municipalities and to tax commissions and other official bodies, indicate that in most states no compilation similar to that of New York has been made. From the replies received it is evident, nevertheless, that large numbers of municipalities throughout the United States have ample borrowing margins for the financing of needed public works—if a market can be found for new issues of securities. A summary of reports from some of the states follows:

MASSACHUSETTS.—Theodore N. Waddell, Director of Accounts of the Commonwealth, reports that the percentage of general debt to assessed valuation in the cities of the state this year is only 3.43 per cent; in towns of over 5,000 population, 2.29 per cent; and in towns under 5,000 population, 1.21 per cent. As Massachusetts has no constitutional restriction of municipal debt limits, the Legislature could authorize the municipalities to borrow substantial sums to meet the present emergency without overstepping the limits of conservative municipal finance. This is evident from the fact that the cities of Pennsylvania and New Jersey may borrow up to 7 per cent, and those of New York State up to 10 per cent, of their taxable property valuations.

WASHINGTON.—A letter from Fred D. Chesnut, Chief Examiner of the Division of Municipal Corporations, says:

"For the year ending December 31, 1930, the county debt proper of the state of Washington amounted to a trifle over $25,000,000, leaving a margin of approximately $37,000,000. This, however, does not include school districts, of which there is a debt of approximately $30,000,000, with a margin of about the same amount. We have no figures available for cities and municipalities, of which there are some 216 in the state, but the debt margin is approximately in the same ratio as the foregoing taxing districts."

INDIANA.—"At the present time," writes Frank G. Bates, Executive Secretary of the Municipal League of Indiana, "the outstanding bonded indebtedness of all municipalities is $87,546,105.72. This leaves as the total potential borrowing power of all the cities the sum of $19,156,954.28."

OKLAHOMA.—That the present municipal indebtedness of Oklahoma cities and towns is a little less than 15 per cent of the total allowed by law, is shown by a statement just compiled by Roy D. Eaton, Secretary of the Oklahoma Municipal League:

"The Oklahoma constitution sets no debt limit for the purchase, construction or repairing of municipally owned utilities. A debt limit of 5 per cent on a total assessed valuation is established for all other purposes. From the total valuation of assessable property within the limits of Oklahoma cities and towns, amounting to $689,500,000, a possible debt limit of 5 per cent amounts to $34,475,000. Against this possible debt limit only $5,114,849 can be charged, leaving a margin which can yet be legally incurred of $29,360,151."

NEW JERSEY.—In this state the municipalities now have a statutory "net debt" limit of 7 per cent of the assessed value of real property, and the counties a similar limit of 4 per cent. Wylie Kilpatrick, Assistant Director of the Bureau of Municipal Information of the New Jersey League of Municipalities, reports that as of the beginning of 1931 more than half of the 562 municipalities had net indebtedness of less than 3 per cent of their assessed valuation; over 90 per cent were less than the legal limit of 7 per cent; and less than 9 per cent were above the 7 per cent legal limit.

KANSAS.—That the cities of Kansas have a very substantial amount of unused borrowing capacity is evident from the following statement by John G. Stutz, Executive Secretary of the League of Kansas Municipalities:

"According to the 1931 Tax Rate Book of the League of Kansas Municipalities (published January 1, 1932), the average total bonded debt of all of the first-class cities in Kansas in 1931 was only 6.4 per cent of the assessed valuation of those municipalities. There are eleven cities of the first class in this state, ranging in population from 9,087 to 121,001.

"For cities of the second class, the same publication shows total bonded debts averaging 9.1 per cent of the assessed valuation in cities of over 10,000 population; 7.2 per cent in cities of from 5,000 to 10,000 population; 10.6 per cent in cities of from 3,000 to 5,000 population; and 11.1 per cent in cities under 3,000 population. The total number of second-class cities in the state is 77, ranging in population from 708 to 13,524.

"Similarly, for the cities of the third class, the total bonded debts average 13.8 per cent of the assessed valuation in places of over 1,000 population; 8.4 per cent in places of 500 to 1,000 population; and 4.7 per cent in places under 500 population. There are 490 third-class cities, with a population range of 82 to 2,127.

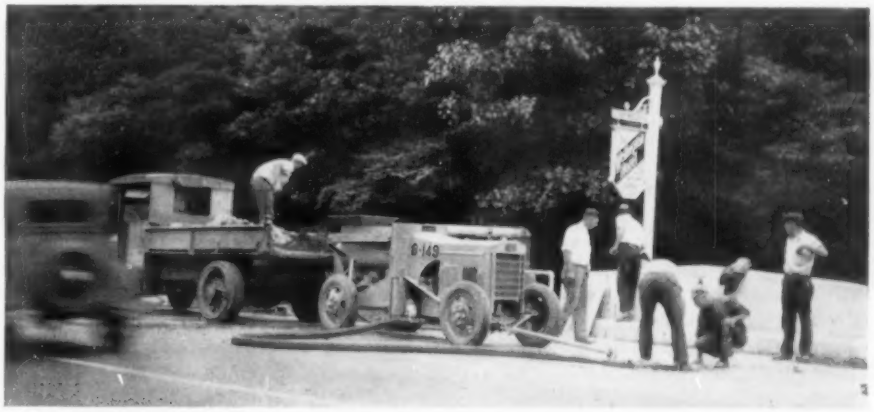
"In the cities of the first class having over 50,000 population the statutory limit for general bonds, excluding public utility bonds, is 5 per cent of the assessed valuation, and for general and special improvement bonds, excluding public utility bonds, is 10 per cent of the assessed valuation; while other cities of the first class apparently have no statutory limits for their bonded indebtedness. Most of the cities of the second and third classes in Kansas are limited to 15 per cent for general bonded debt, and to 25 per cent for general and special improvement bonded debt combined."

Maintaining Rigid Type Pavements by Hydrostatics

By O. C. DAHLMAN

A CONCRETE road, like any other structure, is subjected to the effects of erosion, frost and water. Irrespective of how carefully the cement is manufactured, or the aggregate is prepared, or the concrete is mixed, placed and finished, irrespective of the curing, if the nature of the soil is such that the foundation on which the pavement is laid is not stable, the slab will crack with the readjustment of the soil.

This readjustment may in no way be the responsibility of the construction engineer or contractor, but may be due to water moving underneath or to the natural effect of frost on the only soil available. No matter how carefully the fills are made, there will always be settlement and readjustment as the years proceed. Drainage structures help the situation, but even drains at the side of the road are no guarantee as to this swelling and moving of subgrade materials through the absorption of water.



A MUD-JACK AT WORK ON A HIGHWAY
The road is kept open to traffic at all times during operations

If it were possible to have pavements supported on fills of equal depth at the center and each side, the problem would not be so difficult, but in the very construction of pavements many times there is a cut on one side of the road and a fill on the other, resulting in an entirely different grade condition. The character of the soil in various parts of the grade is different, owing to the necessity of using the materials at hand. The very traffic may affect the two sides of the road differently, the traffic on each one of the halves of the road being in one direction only.

But John Public knows not of the problems of the maintenance men nor of the construction men. He expects a smooth-riding surface that can be traveled over at a speed of from forty to seventy miles an hour with no inconvenience or danger from abrupt changes in grade. He takes the position, and rightly, that he is paying for highways to run his automobile on, and therefore that safety is a part of what he is entitled to expect.

Applications of Hydrostatics to Maintenance

It is expected of the highway department, therefore, that the roads be maintained at an easy riding grade. This is a feasible thing to do by the use of the Mud-Jack. The principle of operation of this machine is based upon the well-known law of hydrostatics that "pressure is exerted with equal intensity in all directions." With this machine the capacity of the surface for handling loads is made available and at the same time is put back to the elevation where it belongs.

There are many instances of subgrade conditions where it is impossible to get complete stability and it may be necessary, therefore, to maintain the road time after time in order to keep it at the proper elevation. Such is the case in eastern Virginia, encountered by the United States Bureau of Public Roads on the construction of the road from Washington to Mount Vernon. A Mud-Jack was purchased for this highway before the highway was completed. This decision, instead of being a reflection on the judgment of the engineers, was a compliment to their courageous foresight in appreciating the character of the soil over which they were forced to build a highway.

Development in Usage

The first work in raising highway slabs was undertaken in Iowa in 1929, and during 1930 approximately 19,000 square yards of pavement were raised in that state. The history of 1931 is the history of the general acceptance of this type of equipment by New York, Connecticut, Pennsylvania, Ohio, Indiana, Kentucky, Tennessee, Florida, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Oklahoma, Kansas, Texas, Washington and California. In fact, machines are scattered from coast to coast and from the Canadian to the Mexican borders. But not only states have found the machine acceptable, but also cities and counties, as well as the Westchester Park Commission of New York and the Panama Canal Zone.

The Mud-Jack has many applications in addition to the raising of depressed slabs. With this piece of equipment it is practical to super-elevate curves which were not given true super-elevation at the time they were built. The same applies to the elevation of pavement prior to widening for the desired grade at intersections; likewise, curves may have to be changed to meet the new conditions. In the same

MUD-JACK AT WORK CORRECTING THE SETTLEMENT OF A STREET-CAR TRACK WHICH IS CARRIED ON CONCRETE

way it would not be feasible to put one or two more strips of concrete along a concrete road unless the surface of the road was brought to a satisfactory grade.

Handling Shrinking Backfill

Water being the enemy of stabilized earthwork, it is extremely desirable that bridge abutments and approaches be protected from movement of fills behind them by having material pumped into place from time to time. In the cities a trench is cut, into which is put a sewer, water or gas line. The backfilling is done as carefully as possible, but it is impossible to get all the materials taken from the prism of the trench back into their original compacted state. The result is that the contractor is required in many instances to leave the ditch open for a time, expecting that setllement will take place. A really dangerous condition is immediately set up, particularly to the heavy automobile traffic that must be taken care of. The effective width of the street is materially reduced, whereas it would have been extremely easy to fill the trench level full, compacting it as carefully as possible, and replacing the pavement immediately. Throughout the length of the replaced slab, 2½-inch holes spaced about 8 feet apart should be left, through which mud is to be pumped to tighten up the grade as rapidly as shrinkage takes place, thereby protecting the pavement on both sides of the ditch from being broken by settlement of the subgrade, and at the same time allowing the immediate replacement of the pavement slab.

The application of this method in cities does not stop with the correction of settlements of pavement and the elimination of settlements of pavement over trenches, but extends to that very difficult and expensive problem of maintaining uniform street-car track in congested business districts. Settlement of track carried in concrete is one of the big problems confronting maintenance men. The settlement can be definitely eliminated by pumping mud through holes in the track structure, raising it to grade.

Now, what other applications are to be found in underground structures? Since it is impossible to protect the surface from subsidence resulting from the placing of sewers and other works at medium dips below the surface in tunnel, it is extremely desirable that the filler behind large sewers be forced in place so as to eliminate all possibilities of surface settlement. This the machine is capable of doing economically and successfully.

In other words, the Mud-Jack opens to the maintenance man an opportunity to get at the source of his troubles and eliminate the cause rather than to attempt to cover up the effect. Every structure which is earth supported, except those structures on piles, is subjected to settlement due to conditions arising after the structure is built. These structures can be saved from early depreciation by the application of this device in stabilizing their support by replacing the earthwork that has failed.

Provide Safety for Motorists and Pedestrians Alike

To the Editor of THE AMERICAN CITY:

In your excellent letter entitled "Wider Federal Aid" in today's *New York Herald Tribune* I am glad you suggested the doing away with grade crossings. I think this might well be paid for out of the national treasury, since the railroads are hard hit by unfair competition with motors and are finding it most difficult to exist. Failure to do this would be a national misfortune.

There are some other things which I think should be attended to now to lessen unemployment. There are four classes of users of highways: drivers, pedestrians, equestrians and cyclists. The motorists have hogged the whole business as things are now, and something should be done. Part VII of my book on "Simplification of Highway Traffic" offers some suggestions.

The first thing of importance now is to pass a law forbidding the construction of any highway which does not provide for the safety and comfort of pedestrians. Less and less walking is indulged in because it is not agreeable and has become exceedingly dangerous, especially at night. I think at the present time that all highways should be furnished with a sidewalk or a footpath at least on one side and important highways with a sidewalk or a footpath on both sides. Then there are many places where bicycle paths and bridle paths could be provided. These should all be laid out ahead of time and taken advantage of as opportunity presents itself. As an example now of neglect to provide for anything but motorists, see the new boulevard from Washington to Mt. Vernon.

WILLIAM P. ENO,
Chairman, Board of Directors, Eno Foundation for Highway Traffic Regulation, Inc.

Washington, D. C.
May 13, 1932.

Don't Curtail Public Health Work

The present emergency has called forth the following resolution:

RESOLVED by the Executive Board of the American Public Health Association, that every effort be made to maintain and even to advance the effectiveness of our health departments, and that the various agencies in the communities interested in the public health be asked to maintain unimpaired health budgets, trained personnel and services which have proved their worth in safeguarding the first wealth of every community — the health of its people.—*Child Health Bulletin.*

To Blast or Not to Blast

Making Fills in Swamp Areas

By C. L. WOOLLEY
Construction Engineer, Rhode Island State Board of Public Roads

FOR the past two years the problems of accelerating and obtaining complete settlement and subsidence of fills over swampy areas has been actively studied in Rhode Island in order that final pavement over such land may be placed within a single construction season without fear of settlement or displacement. Fortunately Rhode Island swamps do not run much deeper than 15 feet nor are they over 1,000 feet long.

Making Fills According to Types of Swamps or Bogs

Three general types of swamps or bogs are found in Rhode Island.

The ordinary swamp in which the soils are light sands, silts and sandy loams which are saturated by pocketed water is the easiest to handle. It can be recognized by the presence of surface boulders, large trees and good materials in borings of test pits. We have found that no special treatments such as dredging or blasting are necessary to obtain compact fills on ordinary swamps, particularly if there is an opportunity to lower the water level in the swamp by deepening the outflow. Fills of varying thickness have successfully carried pavements, provided the fills have been allowed to settle over one winter and provided care has been taken to make them in lifts of less than 3 feet. The equipment used to haul and spread the material, such as 5-ton trucks, heavy bulldozers and Linn tractors, has given such fills the needed compaction.

TEARING APART THE TOP MAT OF A SWAMP COMPLETELY

The second or "muck" swamp is caused by channel changes or is a low area intermittently flooded by an adjacent stream or pocketed water. The material in the swamp is light—usually a loam or silt which becomes fluid when saturated. Good-sized trees and surface boulders are rarely found in this type of swamp, and test pits usually show liquid mud. This type is often covered with a mat of grass and small brush. Tidal marshes come under this classification.

Fills over muck swamps and tidal marshes do not usually need anything other than ordinary compaction where the top mat is less than a foot thick, the swamp not more than 3 to 5 feet deep, and the fill height above water level at least 4 feet. The weight of the equipment and the process of placing the filling material will in such cases break the crust and displace the muck sufficiently to prevent later subsidence.

Explosives Needed to Break Heavy Mats

If the top mat is more than 12 inches in thickness, and especially if it consists of a matted growth of brush and small tree roots, it should be destroyed, preferably by blasting. Effective removal of the top mat is accomplished when ½-pound sticks of 50 to 60 per cent dynamite are set 1 foot below the swamp level and spaced every 18 inches and then fired by propagation. This destruction of the top mat over muck and liquid mud swamps whose depths are less than 6 feet is oftentimes enough to allow the complete infiltration of the new fill, and no subsidence will occur.

Fills Settled by Blasting

If the muck is deeper than 6 feet, however, an additional treatment has proved necessary. The top mat having been blown up, the process of making the fill is started. As each 50-foot station is reached, three 1-1½-inch pipes are driven into the face of the fill down to hardpan. The pipes are then loaded with dynamite at a point midway between hardpan and the base of the fill. When the shot is fired, the muck moves out to the sides and the fill settles. If the progress of building up the fill is less than 100 feet per day, shots are fired every noon and night. Generally this method of breaking the top mat and blasting the muck under the fill gives complete subsidence.

Costs

The actual dredging or bodily removal of muck and liquid mud has not proved economically successful in Rhode Island. On one project some 14,000 yards of mucky peat was removed by crane and deposited on the adjacent right-of-way at 45 cents per cubic yard. The trench was backfilled at 45 cents per cubic yard, giving a total cost of 90 cents for dredging and backfilling. On a similar project treated by blasting away the top mat and

PREPARING TO BREAK UP A MAT

"Planting" half-pound sticks of 60 per cent dynamite 18 inches apart to be fired by propagation with one primer cap

reblasting under the fill, the cost was $950 for the blasting, and although the sections showed an estimated 14,000 cubic yards of muck, only 12,500 cubic yards of backfill was necessary. This would indicate that some of the muck had been compressed sufficiently to form part of the fill. Levels over the last eight months have shown a maximum settlement of 1 inch on this 12-foot fill at two localized points some 200 feet apart, indicating that practically complete settlement has been attained. Assuming the same 45 cents for backfill, the saving of the blasting method over the dredging method was, in this case, almost $6,000 on a total cost of dredging of $12,600.

When cranes can be used and the material side-cast, efficient and organized work can be done, but when the muck must be loaded into trucks or crawlers and hauled away, the difficulties of getting in and out of the work are extreme. On some of the work in a neighboring state I have noticed that the contractor has often had to excavate in the muck for as short stretches as 50 feet and then pull his equipment out while he made enough backfill for his shovel or excavator and trucks to attack the muck again.

Muck, being unstable, flows into the trench on every side, and much time may be expended cleaning out the area again and again, while awaiting the backfill. All this costs money, and the burden of payment is of course on the state.

Blasting is not the only treatment nor will it always be the most effective. Experience in Rhode Island in handling muck swamps would indicate that the blasting method is preferable.

The Peat Swamp

The third type of swamp is the peat bog, caused by decomposition of dead trees and vegetable matter standing in water-saturated areas and changed into peat by pressure and natural chemical action. These bogs may be recognized by a heavy layer of deadfall and by the presence of certain mossy growths, notably sphagnum. Usually no large trees are growing, but much dwarf cedar grows on them. Boulders are a rarity. Peat bogs are extremely spongy to the tread, although an excess of water may not be apparent. Test pits show a brown sponge-like substance which cakes when dried.

AFTER ONE EXPLOSION TO REMOVE TOP MAT, THE MEN ARE PLACING DYNAMITE FOR A SECOND SHOT

A SWAMP AFTER THE TOP MAT WAS REMOVED BY BLASTING AND BEFORE FILL BEGAN

Blasting was also used under the fill to further the settlement

Practically every peat bog or swamp in Rhode Island which has required treatment in order to obtain fill subsidence has been so mixed with liquid mud and muck that the treatments noted above for muck swamps have been effective.

One special case, however, arose which upon examination did not appear to be subject to correction by the blasting method. This peat bog varied in depth on the cross-section from 3 feet on the left to 11 feet on the right

under a 6-foot fill, 54 feet wide from shoulder to shoulder. Although the bog was spongy to the tread, no excess water was present, but when test holes were dug they filled by seepage in five or six hours. The water table could not be lowered. We were not so much afraid of subsidence of the fill as of a side-slip to the right. Our solution was to excavate a trench some 10 feet wide for the full depth of the peat on the right side and under the break in the shoulder. This trench was backfilled with a sandy gravel. It is hoped that this gravel-filled trench will act as a dike or dam and prevent the peat from side-slipping. We expect the fill to practically float in position with no subsidence or serious displacement.

Comparative costs which have been obtained on the few projects that have been done in Rhode Island indicate that blasting has cost about one-third as much as dredging or excavating and backfilling.

Important Factors

From the foregoing it will be noted that the factors to be considered in a problem of fill settlement are:

1. Type of swamp
2. Relation of water table in swamp to surrounding terrain
3. Depth of swamp from the surface to hardpan
4. Thickness of top mat
5. Depth of fill required
6. Cross-sectional slope of hard strata under the swamp

This type of treatment is in its infancy, so that more definite information regarding types of explosives, bearing power of mucks, classification of peats, etc., is needed. An opening for much engineering research is thus presented.

ACKNOWLEDGMENT.—From a paper presented at the Eighth Annual Convention of the Highway Officials of the North Atlantic States.

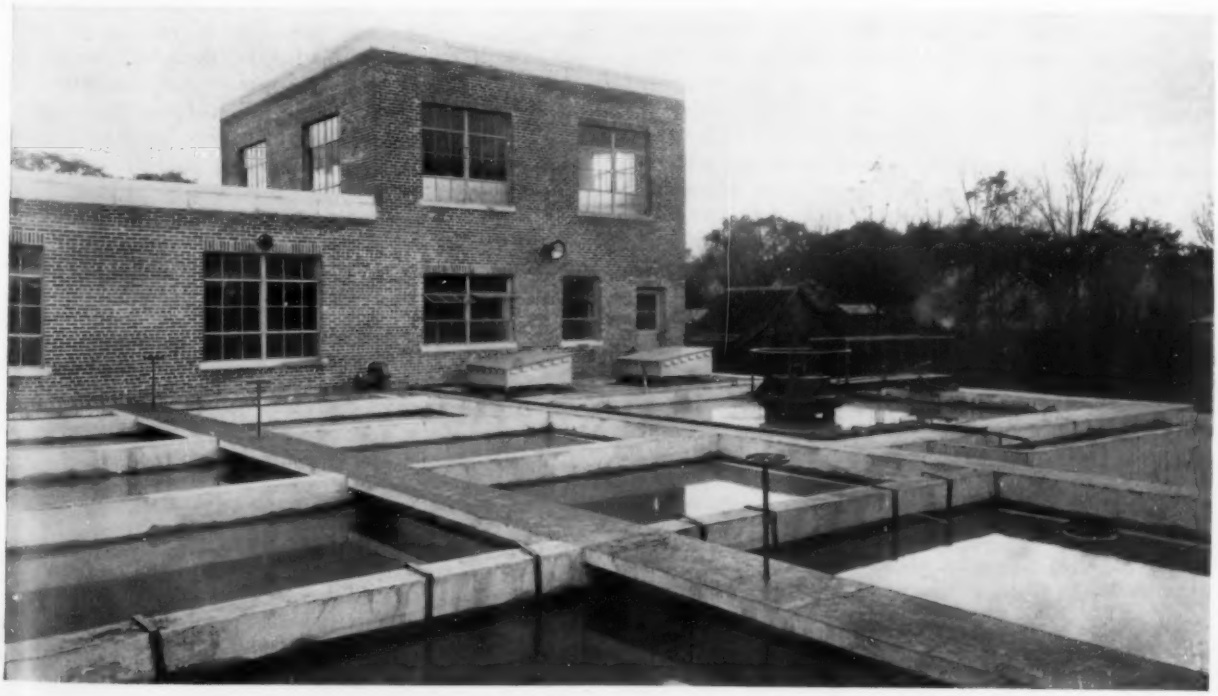
Continuous Lime Slakers Feature Small Water-Softening Plant

By **H. F. WIEDEMAN, M. Am. Soc. C. E.**
Wiedeman and Singleton,
Engineers, Atlanta, Ga.

THOMASVILLE, GA., is a city of 15,000 population and is located near the southern boundary of the state. Its interests are largely agricultural and it is the winter home of a number of prominent Northern families. The city owns and operates a modern steam-turbine-driven electric generating plant and distribution system and also owns and operates its own water-works plant.

The water supply is obtained from three deep wells, two of which are operated with air and one with an electrically driven deep-well turbine. The total capacity is approximately 1,250 gallons per minute.

The underground water supplies of that part of Georgia south of what is geologically known as the "Fall Line" and



MECHANICAL MIXERS, CLARIFIER AND SEDIMENTATION BASIN IN WATER-SOFTENING PLANT, THOMASVILLE, GA.

THE CHEMICAL FEED MACHINE ROOM, SHOWING TWO MACHINES EQUIPPED WITH CONTINUOUS SLAKERS

which, therefore, lie in the Coastal Plain section of the state, are high in dissolved salts of calcium and magnesium and are hard waters.

The water of Thomasville has a hardness of 200 parts per million, or approximately 12 grains per gallon, of which 135 parts is carbonate hardness—sometimes known as "temporary" hardness—and 65 parts per million is non-carbonate or so-called "permanent" hardness.

There is no definite dividing line between a hard and a soft water, but it is generally said that a water containing 75 to 100 parts per million of hardness is a soft water, while waters containing more than 100 parts per million are considered hard waters. For general domestic purposes, a water containing 4 grains per gallon, or 68 parts per million of hardness, is entirely satisfactory, and it was decided to soften the Thomasville water to this point.

Use of Continuous Lime Slakers

Softening is accomplished by the lime-soda process. Chemicals consisting of quicklime, soda-ash and alum are purchased in bags, in carload lots, and are stored on the third floor of the plant, from which they are discharged into hoppers to the feed machines on the second floor.

Most small water-softening plants have been using hydrated lime because of the supposed difficulty of handling and slaking quicklime. The use of quicklime effects a saving of 25 to 30 per cent in chemical cost, because the cost per ton is the same and the calcium oxide content of quicklime is 25 to 30 per cent greater. The operation of continuous lime slakers at the Thomasville plant has demonstrated the fact that quicklime can be handled and slaked in the small plant without difficulty and with a saving in chemical cost. A further saving might be effected by purchase of quicklime in bulk, but it has been found that, because of the size of the plant, the saving would not justify the cost of installing the necessary conveying and bin equipment.

The water entering the plant passes into two mechanically agitated mixing tanks where lime and soda-ash are added. After about 30 minutes of mixing, during which the chemical reaction takes place, the water passes on to a clarifier where 90 to 95 per cent of the precipitated material settles out and is removed mechanically. Sludge is drawn daily from the clarifier. After leaving the clarifier, the water flows to a carbonating chamber where carbon dioxide gas is added to the water to convert the hydroxides present to carbonates, after which it passes through a plain sedimentation basin to the filters, where it is filtered to remove the finely divided particles of carbonates which have not settled out.

The carbon dioxide gas is obtained from the power-house stack. It is drawn from the stack through a wet and a dry scrubber by a compressor which discharges it through a pipe grid into the carbonating chambers. Two carbonating chambers are provided, one for application of the gas before final sedimentation, and one for application before filtration. At the present time gas is applied only before final sedimentation.

The plant has a normal capacity of 1,500,000 gallons daily and a maximum capacity of 2,000,000 gallons daily. The present water consumption is 750,000 to 1,000,000 gallons daily.

Comparative analyses of the raw water and the finished water from the softening plant are as follows:

	Raw Water	Finished Water
Total hardness	200 p.p.m.	68 p.p.m.
Carbonate hardness	135 p.p.m.	35 p.p.m.
Non-carbonate hardness	65 p.p.m.	33 p.p.m.

Costs and Savings

The cost of chemicals for softening one million gallons of water is:

Quicklime	$7.07
Soda-ash	7.11
Aluminum sulphate	1.25
Total chemical cost per million gals.	$15.43
Cost per 1,000,000 gals. per p.p.m. removed	11.7c

Preliminary figures indicate that the total cost of softening per 1,000 gallons, including chemicals, power, labor and fixed charges, will be less than 4.5 cents per 1,000 gallons.

The economic advantage of municipal water softening is evident when the saving in soap and the saving in repair bills, for water services and appliances, is balanced against the cost of softening. It is estimated that the soap saving, based on the use of 0.1-lb. of soap per part per million of hardness per 1,000 gallons, and the use of 3 gallons per capita daily for bathing and laundering, is $25,000 per annum, and the saving in repair bills may be placed at $3.50 per service per annum, or $7,000. The total annual operating cost is approximately $10,500. The annual saving for the water consumers is therefore $21,500.

In addition to the direct financial benefit, there must also be considered the personal comfort and convenience which is derived from the use of a soft water.

The plant is being operated under the supervision of D. Rhett Pringle, Superintendent of Water and Light. The construction of the plant was financed by the Water and Light Committee, from operating revenue. Wiedeman and Singleton, engineers, Atlanta, Ga., were the consultants on design and construction of the new plant.

THE CHILD AND THE COMMUNITY

ALTHOUGH the first and greatest opportunity lies with the parents, there is no parent, however, wise or great or good, who can succeed without the help of the community. What parents will be able to accomplish for their children depends upon the community assistance they can command as well as the self-sacrificing and affectionate intelligence they themselves bring to the task.

GRACE ABBOTT.

Salvaging and Relaying Brick Pavement

BEGINNING THE REPAVING OF WEST MAIN STREET, CHILLICOTHE, OHIO

By **GEORGE F. DRISCOLL**
City Engineer, Chillicothe, Ohio

AS seen by the average citizen, the outstanding features of the improvement of West Main Street, Chillicothe, in 1931, are the removal of the dangerous parkway strips, and the smooth-riding qualities of the new pavement. These things please the abutting property owners also, but they take greater delight in knowing that traffic no longer jolts and bumps its way in front of their homes, that they have a much better street than ever before, and at an insignificant cost to them.

Owing to the fact that this street carries the heavy traffic of U. S. Route 50 and State Route 11, the Ohio Department of Highways was induced to bear the cost of improving the middle section, 20 feet wide. The cost of the remaining 30 feet was paid by the city and abutting property, each paying half.

Original Pavement

This street was originally paved in the fall of 1910, with a 6-inch concrete base, 1-inch sand cushion, and 4-inch repressed brick. The subgrade was a yellow clay. The mix used on the original concrete base was 2 sacks of cement to 1 cubic yard of bar gravel, about 1:13.5 mix. Grout filler, 1:2 mix, was used. For the sake of economy and beauty a grass plot had been placed in the middle of the original improvement, leaving an 18-foot strip of pavement on each side. With parking along the curb, this arrangement caused all traffic to be concentrated on one traffic lane in each direction. Since this street was the main artery leading to Camp Sherman, during the World War, it took a terrific amount of punishment. An examination of the pavement, before the 1931 improvement, showed the brick to be in very good condition. Without a doubt the bumps and waves present were due to the failure of the base.

Old Brick Re-used

The main object sought in the improvement of this street was the removal of the dangerous grass strip in the center. Two types of improvement were considered—resurfacing with asphalt, and relaying the old brick. Seriously doubting that relaying the old brick would result in a satisfactory job, the abutting property owners were much in favor of asphalt resurfacing. However, we decided to relay the brick because it would result in a better street at a smaller cost to the abutting property.

As the old brick were 3½ x 4 inches, laid 4 inches deep, it was decided to turn them to lay 3½ inches deep. The plans called for a new 3½-inch brick pavement with new concrete base for the 20-foot section in the middle, with the remainder relaid with old brick on the old base. A unit price bid was taken on base replacement, making it possible to replace any or all of the old base. The contract for this work was let to Brewer and Brewer Sons, Inc., who sublet it to W. H. Ringwald and Sons, who laid the original pavement in 1910.

New Base for the Old Section

The brick were loosened with bars, the bats and broken brick were hauled to widen a nearby road, and the good brick were piled in the gutter. They were then cleaned and placed in regular piles behind the curb.

The old cushion was removed and the base examined. It was found uniformly thick, but did not compare in any degree to the quality of the present-day concrete. Most of it could be easily taken out with a pick. Many spots demanded replacement, while others appeared good, comparatively speaking. It was apparent that an attempt to patch only the bad places would result in a base of very non-uniform quality. To relay on the old base was to repeat the mistake of twenty years ago. We had suspected that a new base might be a sensible thing and had arranged to have enough money available for this purpose in our gasoline tax fund. And now that the job is completed, nothing gives me more assurance and satisfaction than the knowledge that under the brick surface there is an adequate base.

It may not be amiss to mention a few methods used in the construction of the base. It was desired to use a finishing machine on as much of the base as possible.

Accordingly, two sections, 5 feet in width, were poured along each curb and finished by hand. This also made it easier to establish a true gutter line. The remainder was then poured in two 20-foot sections and finished by machine. To keep the wheels of the finishing machine from riding on the green concrete of the adjoining slab, a 2 x 4-inch plank was placed on the edge of the adjoining slab, and was held in position by 8-penny nails, which were previously set, heads downward, in the fresh concrete.

It was also necessary to change the symmetrical crown in the finishing machine screen to the unsymmetrical crown which began at the centerline of the street and extended 20 feet to one side. This was done by bolting to the bottom of the screed a wooden plate cut to the proper size and shape to fill the difference between the crown of the screed and the required crown of the side of the street.

Laying the New Center Section

Since the state was putting in new brick, it was necessary to lay these in the middle part of the street, with the old brick being relaid at the sides of the street. The new brick were piled on the base just to one side of the middle section. It was then found that the old brick were a little smaller than the new, about fifteen rows of new brick matching sixteen rows of old. This of course prevented us from interlocking the old brick with the new. We decided to separate the old and new brick with a header consisting of a single row of brick laid lengthwise.

The sand cushion for the middle section was prepared first, by drawing a template, which was mounted on two 1-inch boards lying on the base. To aid the bricklayers in keeping a straight line along the edges, planks weighted with brick were laid lengthwise on the sand. The easiest and best way to keep these planks in a straight line was by using a transit. The laying of the middle section was kept about 20 feet ahead of the side sections. The sand cushion for the side sections was luted by hand and the old brick laid.

WEST MAIN STREET AFTER THE BRICK WERE RELAID

Note that the radius in the foreground has been increased

START OF REPAVING, SHOWING THE CENTER GRASS PLOT

Unusual Type of Losses of Old Brick

Although we have gained approximately 12 per cent by turning the 4-inch brick to lay 3½ inches deep, we lost almost as much owing to the fact that the manufacturer's name, in raised letters, was on one side of the old brick. Thus, if a brick had a bad corner, it was not possible to use it by turning. Another feature caused the loss of some brick and slowed up the work of the men who were "batting in." The old repressed brick were so hard that it was very difficult to break them into bats of the proper size and shape. The old brick required more rolling and more asphalt than the new brick. The usual methods of culling, rolling, straightedging, filling with squeegee buggies, and sanding, were used.

The contract price of relaying the brick was 88 cents per square yard, which included cleaning, new sand bed, relaying and asphalt filler. From 3,533 square yards of old brick pavement, 2,900 square yards of relaid pavement were constructed, besides several loads of brick that were stored to be used for patching. This is a reclamation of about 82 per cent.

The results obtained by relaying brick on this project were very satisfactory. The old brick surface is every bit as smooth as that of the new brick. After watching the efforts of the men who were making bats of the old brick, I am firmly convinced that the old brick will last as long as the new. These old brick had already served traffic for over twenty years.

Timely Comments

Before the plans are completed on a relay proposition, it is a good idea to take up a section about 10 feet square. It will then be possible to get an idea of the probable number of brick that can be relaid, the sizes of the brick, the ease of cleaning, and the condition of the base and subgrade. Have enough money available to be able to take care of any sort of base replacement that may be required. And while the brick are being taken up, see that the bats are saved and cleaned.

The uses of old brick are many and varied. We have many jobless men who are dependent upon the city Welfare Commission for food and clothing. A pile of old brick is a partial solution of this problem, as it is possible for the city to get some return for the charity it must give. These men under the direction of a foreman can clean, cull, and group the different sizes into neat piles. This latter operation is the answer to the plumbers and utility companies who cannot get brick to match ones laid in old pavements.

Alley intersections and approaches, gutters and walks can be paved with old brick very satisfactorily. Old brick also can be used at intersections where the curb radii are increased to make turning easier and safer. At the end of pavements, chuckholes which are impossible to keep filled with gravel can be eliminated by paving with old brick. And, of course, sewer manholes, catch-basins and foundation walls are other very common uses of old brick.

The Handling of Unprofitable Water-Main Extensions

By **H. B. RICHARDS**
Superintendent, New Castle Water Co.
New Castle, Pa.

How Far Should a Water Utility Be Required to Go?

WATER utilities are faced with the perpetual problem of unprofitable extensions. Unfortunately, the Pennsylvania Utilities Commission has not established a definite rule by means of which a utility may know in advance just what its obligations and its rights are in the matter of making extensions that do not yield sufficient revenue to pay their way.

The Commission has said that, in general, the consumer should not be required to finance the capital expenditures of the utility, but that an extension may not necessarily be refused on the ground that it is not profitable. Each extension must be considered as a separate proposition, on its own merits, and the determining factor is the reasonableness, considering all the elements in each case.

No Definite Guide

With these broad principles laid down before us, and the decision heretofore made in individual cases as a guide, we sometimes find ourselves at a loss to determine what is the equitable thing to do, as between the obligation of the water company and that of the consumer. We are apt to be drawn to the conclusion that in most instances the water company has a greater obligation to install the extension than the consumer has to make it pay its way: on the broad theory that the consumer has no place else to go to for water, and that a single non-productive extension may be absorbed by the utility without reflecting much loss in the general revenues of the plant as a whole.

Of course other types of business are not ordinarily operated on this basis, because a non-regulated industry cannot be required to deliver its product at a loss, nor can it be restrained from restricting sales to customers of its own choosing.

Types of Non-Productive Extensions

There are three general types of non-productive extensions with which we usually have to deal. The first is the case of running mains into virgin territory as part of a real estate promotion scheme, such as the opening up of a new subdivision. In this instance, few if any houses are in existence, and the element of necessity on the part of the individual consumers is absent. It is largely a matter of some one's making an investment for the primary purpose of selling property at a profit. Only one owner or a real estate corporation is involved. This is clearly not a case where the utility should make a losing investment which later on might be passed on to the general public in increased rates, because neither the utility nor the public is interested in promoting real estate projects for private profit. It is manifestly not good, sound public policy, for a water utility to make a heavy investment and assume the burden of anticipating revenues which might not materialize. Real estate operators, and owners of vacant ground, are prone to be excessively optimistic, and it is common knowledge that in many cases their rosy dreams fail to come true.

It is entirely proper with this class of extensions to require the owners to finance the proposition on some type of refunding agreement. One method is to use the system approved by the New Jersey Commission, by which the entire cost of the investment is advanced by the owners of the property to the water company, and the water company refunds to the owners, over a period of ten years, at the time that each house is built, three and one-half times the estimated yearly revenue to be derived from that particular house.

Another method is to make the refunds to the land company annually over a period of ten years at the rate of 50 per cent of the gross revenues derived from properties abutting on the extension in question. In both cases, of course, the total refunds should not exceed the total original investment.

The second case is that of a number of scattered properties, all owned by different persons, frequently of small means, who want water because their wells are not satisfactory or are drying up, or for some other good reason. Usually they will all sign a petition to take water if the mains are extended, but after the job is completed, frequently some of the contracts are not kept. This is a hard and long drawn-out situation to handle, if there are many

consumers involved and if any considerable contribution is required from them, because it is difficult to get them all in accord at one time as to their respective shares.

It is usually out of the question to expect to have the line financed on any refunding type of agreement, for a number of self-evident reasons. The simplest plan seems to be for the utility to determine how much investment it should reasonably make, based on the known or presently available return, and divide the balance up equally among the consumers who are parties to the agreement, such contribution not to be returned. This contribution or bonus may be in cash or in labor furnished by the consumers, or both. A practical way to handle the matter where the consumers want to work out their several shares on the job, is to take notes from them for the amount, and apply their pay checks against the notes.

The hard part is to get an agreement as to what the consumers' share is, for we must not lose sight of the fact that the average consumer is constitutionally opposed to making any contribution of any kind to any utility. He is not interested in the fact that upwards of 50 per cent of the water company's gross income is required for operating expenses alone. He thinks it is "none of his funeral" that on his particular extension the gross return may not even pay the interest on the investment, not to speak of operating expense or profit. Besides, he is frequently financially unable to make much of a contribution, even if he were willing. It is likely that consideration of these elements has some bearing on Commission decisions.

An Example

The most recent case reported in Pennsylvania is that of the Summit Water Supply Co., being Docket No. 8242. The company has about sixty regular domestic consumers and has connections for an emergency supply to the town of Lilly and the borough of Cresson, but the bulk of its supply goes to the Pennsylvania Railroad Co. at Lilly. Sixteen families applied for water service, one of which could be supplied direct from the existing main with the usual service line. The other fifteen would require a total of 2,710 feet of main line extension, and they would produce a total estimated revenue of $180; or, considering the family on the existing main, they would produce an annual revenue of $192.

The water company asked the consumers to furnish the labor for excavating and filling, do the hauling of pipe, and pay $50 bonus each, on which basis the gross return to the water company would be 11 per cent, and considering operating costs and depreciation, the net return would be 4.34 per cent. The Commission hearing resulted in eliminating the $50 payment from each consumer, and the lines were ordered installed subject to the consumers' furnishing the labor above mentioned. On this basis the water company made an investment of $2,450 to secure a return of 7.8 per cent gross, or 2.6 per cent net.

If a utility were required to make a material percentage of increase in its capital structure, on the basis of the Summit case, quite likely a revision of its rates would be necessary, and it is likely that the Commission, in decisions of this kind, gives considerable weight to the fact that the percentage of net return on the plant as a whole is not materially affected.

Of like import is the third class of case where a single consumer buys a lot beyond the existing facilities of the water utility, because he can save some money on the ground, as compared with the cost of lots facing on existing water mains. If there is no economic necessity for him to get so far away, other than the matter of buying a cheaper lot, when plenty of others are available adjacent to utility facilities, he should not expect the water utility to carry the burden in order that he may make a profit. That is to say, he should be willing to divide some of his savings on the cost of the land, sidewalks, street improvements, taxes and the like, together with the cost of a well and pump, with the water utility, in consideration of its running an unprofitable line for his benefit.

The Factor of Topography

It would appear that, generally speaking, where a street is not laid out, or where it is not graded, the obligation of the utility to make unprofitable extensions is not so great as where streets are to grade, and where there is prospect of additional building activities. That is, if a street is on an ungraded hillside, where there are apt to be heavy cuts or fills, so that the line cannot in the first instance be laid in a permanent location or without excessive cost, it would be unreasonable to expect its installation.

In considering extensions, it should not be lost sight of that, speaking in round figures, over a term of years, for each dollar spent on the average extension, another dollar must be spent for additional station facilities, transmission lines and the like; that service lines and meters must be installed; that interest must be earned in some way, together with earnings to cover operating, maintenance and depreciation charges on the whole investment.

Considering the proposition just stated, let us see where we shall come out with a main line extension in the amount of $1,000 on which the gross return is 28 per cent, or $280.

Main line investment	$1,000
Additional plant investment	1,000
Total ultimate investment	2,000
28 per cent return on main line investment	280
Operation one-half of gross return	140
Net return	140

$140 is 7 per cent net return on ultimate plant investment.

On this basis it would appear that the usual return allowed on small individual extensions is inadequate and that to obtain a net return of 7 per cent we should expect a gross return of approximately 28 per cent on the amount of the main line investment.

ACKNOWLEDGMENT.—From a paper read before the Pennsylvania Water Works Association.

AMERICANS AT INTERNATIONAL MUNICIPAL CONGRESS

AS this issue of THE AMERICAN CITY goes to press, ten leaders in American municipal affairs are in attendance at the International Congress of Local Authorities, meeting in London during the week of May 23. The delegation from the United States and Canada comprises:

Samuel Baker, Executive Secretary, Union of Canadian Cities
Paul V. Betters, Executive Secretary, American Municipal Association
A. E. Buck, Institute of Public Administration
Louis Brownlow, Director, Public Administration Clearing House
Luther Gulick, Director, Institute of Public Administration
J. Herman Knisely, Executive Secretary, Pennsylvania State Association of Boroughs
Samuel C. May, University of California
Guy Moffett, Secretary, The Spelman Fund
Harold D. Smith, Director, Michigan Municipal League
Morton L. Wallerstein, Executive Secretary, League of Virginia Municipalities

Sedley H. Phinney, President of the American Municipal Association and Executive Secretary of the New Jersey State League of Municipalities, whose untimely death occurred on May 9, was to have served as chairman of the American group.

Entire City Benefits from Sensibly Planned Unemployment Relief

SOUTH SIDE OF THE MCDONOUGH COUNTY COURT HOUSE, SHOWING THE 11-FOOT WIDTH GAINED BY REMOVING THE OLD HITCHING RACKS

By **E. F. RAWCLIFFE**

THERE are no bread lines in Macomb, Ill.—yet no one had to go hungry there last winter. A well-organized relief plan under which all unemployed citizens have been given useful work has practically eliminated the need for direct charity and has provided the city with many improvements.

Macomb is a small city in central Illinois. It is the county-seat of McDonough County and has about 8,000 inhabitants. It is largely an agricultural center, but many of its citizens depend for a livelihood on local factories, which through the past year or two have been operating on a greatly curtailed basis. As a result, the unemployment situation in the city is serious.

Community Chest Supports Work

To cope with the problem, the Macomb Unemployment Bureau was organized and incorporated under the direction of Aleck J. Fish and Mrs. John Norton, who serve entirely without salary. Last fall, a community chest fund of $13,000 was raised by popular subscription and the money turned over to the relief organization. A subsequent drive during the winter months brought in $2,500 more, making a total of $15,500 available to help jobless residents. Of this amount, only about $500 has been paid out as a dole, and that only to families incapable of paying in labor for the help they receive.

With the remainder of the money the Unemployment Bureau is providing work for 290 men who contribute to the support of 1,100 people. When the Bureau started to function, the directors looked around for jobs which its men could do. Work was not hard to find. There were many improvements needed around the city which had been waiting only for the time and the money to get them under way. The Unemployment Bureau arranged to furnish man-power for these jobs, while the city agreed to provide the materials and supervision.

Small Jobs Improve City

Already, a great deal has been accomplished. The old hitching-rack around the public square has been removed in deference to the motor age, and two new hitching-racks have been built away from the public square for those who still drive old Dobbin on their Saturday trips to town. Four streets leading into the square have been widened to provide more room for parking, and new concrete gutters have been built entirely around the business section. Old brick sidewalks have been relaid, and streets all over the community are being repaired and maintained. A storm sewer has been built, and work is now in progress on the widening of the public square by laying a 5-foot strip of concrete on all four sides. Plans for future work include paving one alley in the business district.

All these improvements were greatly needed in Macomb if the community was to continue its normal growth and keep pace with changing conditions brought about by the motor car. The program undertaken this winter has killed two birds—or maybe three—with a single stone. The city has secured essential improvements at only a fraction of their normal cost; all jobless citizens have been helped with work—the only acceptable form of relief for self-respecting men; and—of great importance at this time—it was unnecessary to levy additional taxes either for relief work or for the improvements.

Tree-Planting Program

In addition to the construction and repair work done, some labor has been devoted to beautifying the city. Old, dangerous trees on public and private property have been removed. New trees and shrubs are being planted in public parks and two rustic bridges have been built.

All paved roads leading into Macomb are being beautified as far as the county line by planting native shrubs and trees in accordance with a plan laid out by the State Highway Department. On this work outside the city limits, the men have received their pay in fuel. More than $500 worth of coal has been supplied to Macomb house-

holds by the county, and the family breadwinners are working this out under the direction of the Unemployment Bureau. Pauperism is a thing of the past in Macomb; every able-bodied man who has been helped—no matter what the source of the aid—has given full value for value received.

Other Types of Work

Some of the work being handled through the Unemployment Bureau is of direct benefit to the jobless men themselves. All trees cut down are chopped up for the community woodpile from which needy families may secure their kindling. Men who are unable to do heavy work collect used clothing from families around Macomb and help put it into condition for further wear.

Merchandising Plan Builds Character

Each man is given 8 hours per week, for which he is paid at the rate of 30 cents an hour. At first thought it would not seem possible to support a family for a week on $2.40, but the Macomb plan makes it possible for this money to go a long way.

The men are paid in merchandise orders on any store which they select, good for necessities only. Local merchants have agreed to add 10 per cent to the face value of each order, making it actually worth $2.64 to the workman. At unemployment headquarters, supplies of basic commodities such as flour, rice, and beans are kept which are purchased in large quantities at very low prices. Each man is given a supply of these staples every week. He also receives seven tickets good for seven quarts of skimmed milk at one of the local dairies. Not to be outdone by other business men, the owner of the local theater presents a ticket good for one admission for each day's work.

The merchandise orders may not be used in the purchase of clothing. Those in need of clothes must secure them from the stock collected by the Unemployment Bureau.

If a workman is already in debt to one of the merchants in the town, he is required to have his purchase order made out to that man. However, the merchant may not take the order in payment of his debt, but must give the man full value of necessities in exchange for it. There are two reasons for sending the debtor back to the store which carries his account. First, he must face the man to whom he owes money; and, second, the merchant receives a certain amount of business which he would not get if the debtor traded elsewhere to avoid facing him.

"Proof of the Pudding"

Through cooperation of every one in the city, the Macomb plan is working splendidly. That the fellows who are on their uppers are grateful for a chance to earn their bread is shown by the spirit in which they work on the jobs assigned to them. More than once this winter, when a man had finished his allotted hours, he casually remarked that he would finish the day with the rest of the crew. There was no pay for those extra hours, so it looks as if any charity involved is working both ways.

Refuse Collection on 36 Miles of Streets

By **GEORGE D. EVANS**
Commissioner of Public Works, Peekskill, N. Y.

THE collection of refuse, including garbage, ashes and rubbish, in Peekskill, N. Y., is handled entirely by village employees. Over 36 miles of residential and business streets are served by the municipal collection equipment. Everything except automobile bodies is removed.

The village is divided among three crews, each of which operates with a 2½-ton truck with high side boards. Each crew consists of one carry-out man, who works well in advance of the truck crew, one man in the truck to keep the load dressed and compacted, and two loaders. Every day, except Sunday, rubbish is removed the first thing in the morning throughout the business district. The three crews work at this from 8 to 9 and complete the work usually with one load to a truck.

After 9 A.M. the residential sections are served, the carry-out man having had up to this time to get ahead with his work. From around September 1 to July 1, only a single collection is made per week in the residential sections. During the warm weather each crew covers its territory twice a week. The same schedule is adhered to, with intervals of three days between the first and second collections of garbage. If Monday is the regular day for collection, the second or garbage collection is made on the same street the following Thursday. This is made possible because the work is lighter, since there are no ashes to be handled. A village ordinance prohibits leaving any cans on the curb over night.

The village dump is free for general clean dumping. It is located at an average haul distance of 1¼ miles from the various collection sections. All combustible material is burned on the dump. The total mileage for the three trucks was 18,519 miles or 6,173 miles each in 1931. About 36 tons of refuse is handled each day during the winter season, the trucks making six or seven trips. During the summer the same crews find time to pick up piles of dirt and leaves from street sweepings and trimmings from trees.

Costs

3 truck drivers	$5.50 per day
9 men loading	4.50 " "
3 carry-out men	4.50 " "
1 man on dump	4.50 " "
Foreman—no one especially assigned to this work	

Summary of Cost for 1931

Labor	$23,475.00
Trucks (average life six years)	1,200.00
Truck repairs	2,001.04
Gasoline, 6,045 gallons	659.74
Oil, 149¼ gallons	89.55
Total	$27,425.33

Water Treatment Today— and What of the Future? *Part II*

By ESKEL NORDELL*

The Treatment Processes

For obvious reasons, the suspended matter is very objectionable and it is therefore necessary to remove it whenever present in appreciable amounts. This is best accomplished by proper coagulation, settling and filtration, which remove coloring matter as well as turbidity.

Coagulation is effected by adding a solution of a coagulant, such as aluminum sulphate or cooperas, to the water. The coagulant reacts with the alkalinity in the water, producing an insoluble material known as a floc. When aluminum sulphate is used as a coagulant, the floc consists of gelatinous aluminum hydroxide. When copperas or other iron salts are used as coagulants, the floc consists of ferric hydroxide. When this precipitation is properly carried out, the floc carries down with it the turbidity and coloring matter. In the case of certain waters high in coloring matter but low in suspended matter, it is sometimes necessary to add a slight amount of clay to the water in order to assure efficient color removal.

After coagulation, the treated water may be settled, this operation being carried out in large settling tanks or basins where the detention period is sufficiently long to allow the bulk of the floc to separate from the water. In this way, a settling tank is of great advantage in that very little of the floc gets over into the sand filters and therefore the load which they must carry is greatly reduced. The settled sludge is periodically removed from the bottom of the settling tank or basin by means of a de-sludging system equipped with quick-opening valves and scrapers. In the case of smaller installations where the turbidity is low, settling tanks may be dispensed with and filters alone may be used.

After settling, the water is filtered through sand filters in order to remove any matter which has not completely settled out. The sand filters may be of the gravity or the pressure type. In either case, the water is filtered downward through a bed of carefully graded gravel lying over an underdrain system composed of headers, laterals and evenly spaced strainer heads. If the coagulation has been properly carried out, the filtered water should be bright, clear and practically colorless. The accumulations of foreign material are periodically removed from the surface of the filter bed by the operation known as backwashing. Backwashing is done by sending a strong flow of water upward through the filter bed. This suspends and separates the sand grains, lifts and flushes out the foreign matter, and hydraulically regrades the bed, thus cleansing it and restoring it to its original condition.

The Toll Exacted by Hardness

The fact that the filtered water is clear and colorless, however, does not mean that it is suitable for industrial and domestic uses, for it still contains soluble mineral substances. The mineral substances which cause the greatest difficulties are calcium and magnesium, and compounds of these two elements constitute the so-called hardness of natural waters.

Natural water supplies are often popularly classified as being soft, hard, or extremely hard, but these terms are all relative, because no natural water supply is absolutely soft, any more than any natural water supply is absolutely pure. In popular language, a hard water is one that is very hard to wash in and one that forms large quantities of scale when heated or evaporated. A so-called "natural soft water" is simply one that is not so difficult to wash in and forms less scale when heated or evaporated.

When waters containing calcium and magnesium compounds are used for washing, the calcium and magnesium react with the soap, forming sticky, insoluble calcium and magnesium soaps. The ordinary soaps used for cleansing purposes are either soda or potash soaps. In this country, mostly soda soaps are used. Soda or potash soaps are soluble in water, but calcium and magnesium soaps are insoluble. Therefore, when washing is done in waters containing calcium and magnesium compounds, these insoluble lime and magnesia soaps are formed in and on everything with which the water comes in contact, and owing to their sticky nature, they are not removed in the subsequent rinses.

Insoluble lime and magnesia soaps are responsible for the dirty ring in the bathtub, the "high water mark" on the wrists, and the muddy complexions and sticky hair found in hard-water regions. It is impossible to get a good shave, a good shampoo or a satisfactory bath in hard water. Clothes laundered in hard water are harsh and stiff to the touch, and yellowish or grayish in appearance, and take on an unpleasant rancid odor when stored away.

Continued laundering in hard water greatly decreases the life of the garment so laundered. This decrease varies according to the hardness of the water. In general, the life of garments laundered in hard water is decreased from 20 to 40 per cent. The amount of detergents destroyed by hard water is not a trivial matter, for each 1,000 grains of hardness is capable of destroying 1.5 pounds of soap. This means that 1,000 gallons of 10-grain water will destroy 15 pounds of soap, which at 12 cents per pound would cost $1.80.

Deposits of Scale

When hard waters are heated, a stony deposit known as scale is formed. Depending on the nature of the lime and magnesia compound present in the water, and the conditions attendant on the deposition, the scale may vary from a very soft chalklike material to a very hard flintlike body. Scale forms in cooking utentsils, boilers, hot water coils, water-backs, and hot water piping and it is an exceedingly troublesome material. It reduces the life of cooking utensils. It causes burnt-out coils and water-backs. It chokes the flow of water in pipes, especially the hot water piping,

* Technical Dept., The Permutit Co.

and it chokes up shower nozzles, so that only feeble trickles can be obtained through them.

The deposits of scale get thicker as time goes on, and finally a point is reached where it is necessary to tear out and replace the hot water lines. In the case of gas-heated water coils, this scale formation with very hard waters may be so rapid that the life of the coils is comparatively short. What happens in scale formation is that the mineral matter of the rocks, originally dissolved in the hard waters, has been thrown out of solution by the action of heat or evaporation, so that the German name for scale, "kettle-stone," is very appropriate. Where the water is not only heated but also evaporated, as in steam boilers, the scale formation is even more rapid and more serious than in the hot water lines.

Removal of Hardness

The difficulties attendant on the use of hard water have led to many attempts to remove the lime and the magnesium from the water. The oldest of these methods is the Clark process, and the "clarking" of a water is accomplished by simply adding lime to it. This process is of advantage only with waters containing temporary hardness, and since lime treatment affects temporary hardness alone, it is not applicable to waters containing both temporary and permanent hardness. With such waters, it was found that the addition of soda-ash would reduce the permanent hardness. This method of treatment was formerly known as the Clark-Porter process, but is now almost universally known as the lime-soda process.

When this process is carried out at ordinary temperatures, it is known as the cold lime-soda process. It consists of adding carefully regulated doses of hydrated lime and soda-ash in such proportions that the calcium or lime will be precipated as calcium carbonate and the magnesium as magnesium hydroxide. The process may be either continuous or intermittent. The treated water is allowed to settle for four hours or more and is then filtered through sand filters.

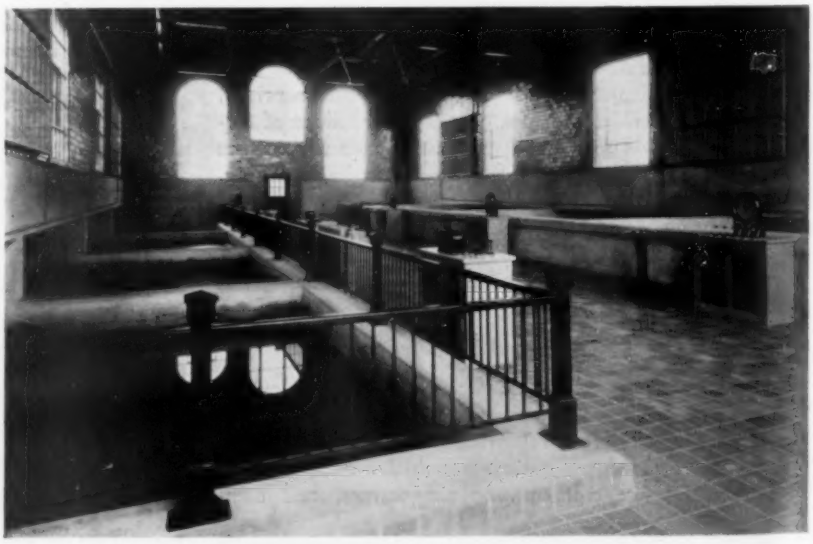
Owing to several factors, results corresponding to the theoretical solubilities of calcium carbonate and magnesium hydroxide are not reached in practice. Instead, it will be found that the effluent from the lime-soda plant will usually contain some 4 to 6 grains in hardness.

Securing Zero Hardness

The simplest and most complete way of removing hardness from a water supply is by the use of the zeolite water softener. This process was discovered about twenty-five years ago by a German chemist, Dr. Gans. Since the substances used belong to the class of minerals known as "zeolites," this process is generally known as the "zeolite" method of softening water. The principle involved in the softening process is that of base exchange, and these substances are also known as base exchange silicates and the process as the base exchange process.

A zeolite softener consists of a shell or tank which contains a bed of granular gravel some 2½ to 5 feet thick, resting on a supporting bed of graded gravel, the shell or tank being equipped so that the hard water may be passed evenly through the zeolite bed, and also so that the various steps required in the regeneration of the zeolite may be expeditiously carried out. The zeolite itself is a complex double silicate in a granular form. In order to soften hard water, it is only necessary to pass it through the zeolite bed. On coming in contact with the zeolite, the hard water gives up its lime and magnesium to the zeolite, receiving sodium in exchange therefor. For instance, if a water containing calcium and magnesium bicarbonates is softened by passing it through a zeolite softener, the effluent will be found to be practically free of the bicarbonates of calcium and magnesium, but will instead contain the chemically equivalent amount of sodium bicarbonate.

Similarly, if the chlorides, sulphates or nitrates of calcium and magnesium are present in the hard water, the chemically equivalent amounts of sodium chloride, sodium sulphate or sodium nitrate will be found in the softened water. The abstracting of hardness that occurs in the zeolite bed is so complete that the effluent is practically free from calcium and magnesium and therefore is known as water of zero hardness or more simply as "zero water." Since active zeolite is an insoluble substances, which reacts only with the hardness, it is apparent that it is impossible to overtreat or undertreat a water by this process. The only effect of the ordinary variations in hardness which may be encountered are that if the water is harder, a correspondingly smaller amount of zero water will be obtained; and if the raw water is softer, a correspondingly greater amount of zero water will be obtained.



FILTER AND SOFTENER ROOM OF A MUNICIPAL COMBINATION LIME PRE-TREATMENT PLANT AND ZEOLITE WATER-SOFTENING PLANT

Concrete gravity sand filters at left and concrete gravity zeolite water softeners at right

After a certain quantity of hard water has been passed through the zeolite bed, the water-softening capacity of the zeolite becomes exhausted. When this occurs, it is necessary to carry out the process known as "regeneration." In regeneration, a strong flow of water is first passed through the machine in the reverse direction to which the water was passed through on the softening run. In other words, this water is admitted at the bottom and flows out at the top, whereas in the softening process the water came in at the top and flowed out at the bottom. This reversal flow operation is called "backwashing," and it serves the double purpose of lifting and removing any insoluble matter which may have collected on top of the zeolite bed during the softening run, and also of thoroughly loosening and hydraulically regrading the granules of zeolite which make up the bed. The backwashing operation is usually continued for about five minutes.

After backwashing, a measured quantity of saturated sodium chloride solution, or common salt brine, is introduced into the softener by means of a hydraulic ejector. The sodium chloride reacts with the spent or exhausted zeolite, forming soluble chlorides of calcium and magnesium, and restoring the zeolite to its original active or sodium condition. A quantity of water is then passed through the bed to wash these soluble calcium and magnesium chlorides and also the excess of sodium chloride to the sewer.

After these salts have been washed out, the softener is ready to be put back into the line. The entire operation of regeneration, including the backwashing, usually can be accomplished in about thirty minutes, although with the very large sizes an extra ten minutes is sometimes required. Where storage space is not provided for soft water, it is advisable to use a multiple-unit plant so that when one unit is taken out of the line for regeneration, the other unit or units will carry the full load, thus insuring an uninterrupted supply of zero water.

Industrial Advantages of Zero Water

Zeolite-softened water is ideal for all washing purposes, for it does not form sticky insoluble lime and magnesia soaps. So, in washing with zeolite-softened water the full effect of all the soap used is exerted on removing the dirt and therefore a much better grade of washing can be accomplished with very much less soap than when a water containing hardness is used. The savings in soaps and other commercial detergents in various cleansing processes when conducted in zero water instead of raw water have been found in actual practice to run from 25 per cent to over 70 per cent. These savings amount to very considerable figures, not only in the industries but also in the household, for they are not confined to savings in detergents alone but include savings in plumbing repairs and renewals, savings in fuel used for water heating or evaporating, and savings in wear and tear on all laundered garments.

Nor does zeolite-softened water form any scale or sludge when used in the boiler. This means that heat units pass directly from the metal to the water without the losses attendant upon having to go through an intermediate layer of scale. The presence of scale not only causes heat losses but, owing also to this insulating tendency, the metal tends to overheat and, as the scale gets thicker, the overheating gets worse, and bagging or burning of the boiler tubes may result. This "misplaced insulation" is especially out of place in the modern boiler, where two to over four times as many heat units must pass through the same area of metal in a given time as formerly. A thin scale—"paper thin" or "eggshell" scales, as they were called—may once have been considered good for the old-fashioned boiler much on the same theory that a certain number of fleas were good for a dog. For the modern boiler, however, no kind of scale is considered good. Instead, clean metal surfaces are required in order that the water may absorb the heat from the metal with as little hindrance or loss as possible.

Zero Hardness an Extravagance for Public Supplies

The advantages of water of zero hardness, therefore, are apparent, but in softening the water for a municipality there is a certain waste involved, for a certain proportion of the water used does not require softening. For instance, the water used for flushing and sprinkling purposes can just as well be hard as soft, and, to make a poor pun, it is no harder to put out a fire with hard water than with soft water. Therefore, unless a municipality were supplied with two pipe lines, one for soft and one for hard water, this wastage of softened water must necessarily ensue.

In a number of municipalities a compromise has been reached, and instead of softening part of the water all of the way, they soften all of the water part of the way. In other words, they consider that if a municipality has been using a water of 10 or 15 grains hardness, the public will probably be quite well satisfied with a water which has only one-half or one-third of this amount of hardness in it.

The usual practice, therefore, is to soften the water to approximately 5 grains, but it cannot be said that this practice is universal, and as the public is all the time becoming better and better acquainted with the benefits of soft water it will insist on getting a better quality of water. There are some municipalities at present which are softening the water to 3 grains instead of 5 grains, and I know of least two municipalities that use water of zero hardness for all purposes. In installing a municipal water-softening plant, it is well to bear in mind that while a 5-grain water may be satisfactory to the public today, the public tomorrow may insist on a water of zero hardness. It is therefore advisable to construct the plant so that it may meet these changing standards.

Owing to its flexibility, the zeolite type of plant is admirably suited to meet such changing demands. For instance, if a raw-water supply has a hardness of 10 grains, a 5-grain water may be easily reduced by treating 50 per cent of the water in the zeolite softener, thus softening it to zero hardness; and then by by-passing the other 50 per cent of the hard water and mixing it with soft water, we get a water of 5 grains hardness. If, later on, the public demands a water of 3 grains hardness, 70 per cent of the water would be softened to zero by zeolite and mixed with 30 per cent of the by-passed hard water; while if a water of zero hardness is desired, the entire water supply would be softened by zeolite.

Iron and Manganese Removal

Iron in the water supply is usually exceedingly troublesome, both in the household and in the industries. The treatment required for removing the iron depends on the form in which it is present. In surface water, the iron may be present in the colloidal form, and such iron can be

removed by proper coagulation with alum, followed by settling and filtration. In deep-well waters, iron is usually found in the form of soluble ferrous bicarbonate. This can be removed by base-exchange with zeolite, or by aeration, which oxidizes the ferrous bicarbonate and forms insoluble ferric hydroxide, which can then be removed by filtration.

Manganese is another trouble-maker found in some water supplies. Its removal is more difficult than the removal of iron, but with proper apparatus very satisfactory results may be secured. Aeration at rather high pH values, or treatment with special manganese zeolite, has proved very satisfactory. With clear well waters, the base-exchange method has also proved efficacious.

Removing Gases and Oil

Concerning the dissolved gases, hydrogen sulphide, if present, may be removed by aeration. Nitrogen is an inert gas and therefore requires no attention. Oxygen, owing to its corrosive tendencies, is undesirable, but its removal from large quantities of cold water has not yet been practiced. Carbon-dioxide is usually present in fairly small amounts and requires no attention. If the carbon dioxide content is very high in comparison with the alkalinity of a water, the ratio may be adjusted by feeding an alkaline material such as caustic soda, soda-ash or lime.

Oil is usually not present in appreciable amounts in municipal water supplies, but its removal from condensate returns is of interest wherever steam is generated. It may be removed by proper coagulation with alum and alkali, followed by filtration through sand filters. The filters are cleansed in the usual manner by backwashing and occasional treatments with hot dilute caustic soda solutions.

ACKNOWLEDGMENT.—From a paper presented before the New Jersey Water Works Association.

Stream Pollution Reduced by Effective Sewage Treatment

The New Sewage Disposal Plant of Burlington, N. J.

THE problem of sewage disposal in the cities and towns along the Delaware River has always been a matter of controversy. With a tidal basin of the Delaware River nearby, the temptation has been to pass the sewage waste directly into the river without treatment, and this has been generally done in the past. As long as the communities along the banks of the river were small and the flow of the river was large, this could be accomplished without menace to the community, and natural aeration in a flowing stream could be depended upon to satisfactorily oxidize the sludge. But with the rapid growth of the riverside towns, together with the reduced stream flow of the Delaware River in times of low rainfall, the condition of the river rapidly became a menace.

The present city of Burlington, N. J., is an industrial community of some prominence. It supports a silk mill and a typewriter ribbon factory and is the seat of the general offices and one of the principal plants of the United States Pipe and Foundry Co. There is also a foundry which manufactures soil pipe and small castings, and in addition Burlington is the focal point for the shipment of fruit and vegetables, for which this section of New Jersey is noted, to the markets of Philadelphia and New York.

The new sewage disposal plant for Burlington is located on the flats just west of the city, near the outlet of the old sewage system. The new system as installed consists of three sets of Imhoff tanks of the reversible type. The sewage to be treated is gathered from the city mains into an interceptor and is carried to a sump-well within the plant. This sump-well acts merely as a flow balancer to assure even flow through the system at all times.

Screening and Pumping

From the sump-well, a 30-inch cast iron pipe conducts the sewage to the screen chamber, where rags and wooden matter which might obstruct the pump are removed. The screens are cleaned once a day. From the screen chamber the sewage is pumped into a 16-inch iron pipe line leading to the Imhoff tanks.

The pumping equipment consists of two Fairbanks-

A GENERAL VIEW OF THE BURLINGTON, N. J., SEWAGE TREATMENT PLANT DURING THE LATTER PART OF CONSTRUCTION

Morse electric-motor-driven vertical centrifugal sewage pumps of 6-inch clearance. One pump has a capacity of 2,000,000 gallons per day, and the other of 1,000,000 gallons per day. There is provision for a third pump if the future growth of the community warrants it. The clearance of the pumps is such as to enable a ball of solid waste 6 inches in diameter to pass through the impeller wheel without damaging the pump, for which reason it is referred to as a "6-inch clearance" pump. The pumps are rated so as to permit a 50 per cent overload to be handled continuously without damaging the equipment. The operation of the pumps is automatically controlled by relay, so that they are started when needed and shut down when the load becomes so light as to make operation unnecessary. At present the load amounts to 1,500,000 gallons of sewage per day.

A VIEW ACROSS THE IMHOFF TANKS

Imhoff Tanks and Sludge Handling

After passing through a venturi meter, the 16-inch line carries the sewage to the Imhoff tanks. Provision is made by a branch line to reverse the flow through the tanks so as to enable the sludge to be easily deposited on the bottom of the tanks. Since 90 per cent of the solid matter is precipitated during the first hour within the tank, and the liquid takes 2½ hours to pass through the tank, it is evident that a considerable mass of solids is formed at the incoming end. For this reason, the flow is made reversible, so as to fill each end evenly and permit more economical action of the anaerobic bacteria in reducing the solid organic matter in the sludge.

The sludge is forced out by hydraulic pressure about once every two or three months into drying beds, from which the liquid filters off into a basin and is conducted back to the screen chamber to be re-treated. The dried sludge, in which most of the organic matter has been oxidized, and which is now practically an inorganic earth, is disposed of at the city dump. It generally takes about one week to dry the sludge in three of the six drying beds, the other three of which are being prepared during the drying time for the next application of sludge. The wet sludge is conducted from the Imhoff tanks to the drying beds through a 16-inch cast iron pipe.

Secondary Settling and Chlorination

From the Imhoff tanks, the water, which is now partially purified, is conducted to a second settling tank. On the way the water is chlorinated, to reduce the bacterial content. The purpose of the second settling basin is to uniformly distribute the chlorine as well as to permit any excess solids to settle out. Such sludge as accumulates in the secondary settling tank is piped through an 8-inch cast iron line back to the pump house to pass again through the tanks. The use of the second settling tank permits whatever grease and soap there is present to rise to the surface, from which it is skimmed off and buried on the city dump.

From the second settling tank, a 24-inch cast iron pipe carries the chlorinated effluent to the drain. The final effluent is superior from the standpoint of purity to that of the Delaware River and is free from organic matter and bacteria.

The plant also includes a chemical laboratory completely equipped with apparatus to control the operation of the equipment. Frequent tests are made to determine the condition of the effluent, its freedom from bacteria, and from organic matter. The plant is also equipped for chlorinating the raw sewage to eliminate odor if necessary. The plant itself is very attractively designed, the buildings being of red brick, and the banks sodded so as to produce an attractive appearance. Shrubs have been planted to enhance the beauty of the place, and the driveways have all been graveled.

The Burlington sewage disposal plant was built by Karl R. Camp, Inc., contractors, under the supervision of Boardman, Probasco and Street, engineers. Samuel Probasco, of Burlington, who was one of the supervising engineers, was appointed temporary superintendent to organize and instruct the plant personnel and to get the plant into a satisfactory operating condition. All of the pipe used in the plant is of cast iron and was manufactured by the United States Pipe & Foundry Co., of Burlington.

Responsible Contractors and Information Service Mutually Benefit

THE importance of financial responsibility on the part of contractors bidding on construction work, public and private, is coming more and more to be appreciated. Reliable records of past performance constitute a prime factor in deciding upon the question of responsibility, and the compilation and presentation of such records is a highly useful task, and a difficult one as well. The benefits of such work apply alike to the public and private officials and corporations having construction contracts to award, and to reputable and responsible contractors seeking such contracts.

An active agency in the performance of this service, the Bureau of Contract Information, Inc., Washington, D. C., which has furnished to architects, engineers and public officials nearly 11,000 individual reports on contracting concerns throughout the United States, has definitely recognized the fundamental importance of this work to the contracting industry and has recently opened the way for the support of its activities by contractors generally as well as by the clients directly served. Such support is voluntary, is open only to those who have filed performance records with the Bureau, and is placed on a flat rate basis, $10 per annum, in order to avoid the danger of favoritism or any obligation other than unbiased investigation of performance records, and disclosure of these without recommendation or prejudice.

Waste Disposal in Pensacola, Florida

By **GEORGE J. ROARK**

City Manager, Pensacola, Fla.

LOCATED in the foot-hills of northwestern Florida and reaching down to the waters of Pensacola Bay, the 150-year-old city of Pensacola has had no particular problem connected with its drainage. The principal soils range from a mixture of clay and light loam to pure sand, which, because of its great absorbent quality, has been a natural aid to the disposal of accumulated filth. Rainfall in this district ranges from semi-tropical to tropical in intensity, and despite the tremendous damage it has done from time to time to the light soils by washing great arroyas or gullies, it has done much to solve garbage disposal problems. It is safe to deposit garbage in these washes and cover them at small expense, as a method of refilling. Good roads have also been an indirect aid in the disposal of garbage. Many of Florida's roads have been built up with a primary base of clay, regardless of the material used for the finished road. The excavations for the clay created great holes in many sections, a large number of them very close to the city. Into these holes garbage may be dumped year in and year out, and after placing sufficient top cover of soil there is no danger to health. A dipper dredge is used to supply a sufficient quantity of cover soil.

LOOKING SOUTHEAST OVER THE CITY HALL, PENSACOLA, TO THE WATERS OF PENSACOLA BAY

Garbage Collection

Garbage in Pensacola is collected by an individual whose contract is for a period of one year. The paragraphs quoted below from the contract show how carefully the public needs are safeguarded by its various requirements:

"For the collection and disposal of all garbage, offal, rubbish, tin cans, broken crockery, paper, sweepings, grass clippings, leaves and other trash mentioned in sections 351 *and* 353 *of the Code of Ordinances of* 1920, *and placed in garbage cans, or other receptacles or containers as required by ordinance, or approved by the city manager.*

"Any additional services that shall be required by the city manager, or desired by the owners or occupants of property, in removing garbage, trash or refuse, including brush, tree limbs and trimmings, junk, building material and similar refuse and not embraced in this contract, shall be paid for by owners or occupants of the property for which the service is rendered, at reasonable prices.

"That for and in consideration of the payment and covenants, which are hereinafter mentioned, to be made, and performed by the city, the said contractor covenants and agrees, for and including the term beginning November 1 and ending October 31, 1932, at his own proper cost and expense, subject to each and all terms, conditions and stipulations contained and mentioned herein, to collect, remove and dispose of or destroy all garbage, offal, filth, rubbish, dirt, trash, refuse matter composed of animal or vegetable substance, and ashes, tin cans, broken crockery, paper, sweepings, grass clippings, leaves and other trash mentioned in sections 351 and 355 of the Code of Ordinances of 1920, from within the city limits.

"All such garbage, refuse and other things embraced in, or contemplated by, this contract shall be collected and disposed of three times a week in the residence districts on the days to be specified, and once each business day in the business district.

"All garbage, trash and other things shall be disposed of, or destroyed at the following designated places, to wit, Bell Head and Goulding or other places which may be mutually agreed upon, subject to change by the city manager whenever the use of the place designated for such purpose may become unsanitary, offensive, or otherwise objectionable.

"The city manager shall have the right to terminate this contract at any time that the contractor shall wilfully neglect, or violate, or refuse to comply with any of the terms, conditions or stipulations hereof, and as to the fact of such neglect, refusal or violation, the said city manager, and/or city council shall have the exclusive right to determine.

"That whenever said contractor shall fail to collect, remove or dispose of any of said garbage, or other things, as provided herein, said city shall have the right to cause the same to be collected, removed and disposed of at the expense of the contractor, and the cost thereof shall be deducted from any payment due, or to become due, the said contractor under this contract.

"That all dead animals shall be kept separate from garbage, trash and refuse and shall be removed and disposed of by the contractor within a reasonable time, not exceeding six hours after being requested to do so.

"That insolence to citizens by the contractor, or any of his employees, engaged in the performance of this contract, shall give the city manager the right to annul this contract.

"That the contractor shall use only wagons or other vehicles properly covered with canvas, or other covering satisfactory to the city manager, and so fitted up that garbage and other things placed thereon shall not be exposed to view, and cannot fall or escape therefrom while such wagons or vehicles are passing over the streets of the city; and the contractor shall

at all reasonable times keep in reserve a wagon or other vehicle to remove garbage in response to complaints of failure of removal made to him or at the city clerk's office; and for the purpose of receiving complaints the contractor shall keep an office in the city of Pensacola connected with the telephone system, which shall be kept open during the usual business hours, every day except Sunday."

Disposal of Débris and Night Soil

The problem of the removal of débris from building operations and the yards of taxpayers is still a problem. For many years, the city government, which was of the commission-charter form up to September 5, 1931, when it was succeeded by a council-manager charter government, had fallen into the habit of furnishing street equipment to any one who requested it for the removal of either small or large quantities of débris from yards, the débris ranging all the way from accumulations of leaves in small quantities to large building wreckage. In many instances the débris included the clearings from large bodies of land being developed. A careful accounting of this activity for only two weeks disclosed the startling fact that the city was called upon to handle more than 200 loads of this débris with its street equipment in that short time. It naturally followed that the plan of street maintenance and improvement was hampered. Excuses as to why things were not being done to carry out the street program were based upon a statement that "the trucks and equipment are engaged in hauling trash." Immediately after this investigation all city street equipment was taken off this service and placed on the work for which it was primarily intended. This meant an additional load on the garbage collection department, and under the new contract, portions of which are quoted above, all yard débris is carried away if placed in containers, but no extra or improvement trash hauling is done by the contractor. Plans are now being made to augment the garbage contract and include the hauling and disposal of all domestic débris.

Nature has also been very kind to Pensacola and the surrounding territory in providing soil absorption and drainage, which greatly simplifies the disposal of night soil. An ordinance has recently been passed which will eliminate all expense to the city, except that of the operation of the Health Department, in connection with the disposal of night soil. Where sewers are not available and where cesspools cannot be built, the sanitary ordinance provides for the erection and maintenance of the United States Public Health Service approved type of pit out-house which has ample capacity and must be perfectly screened to keep out flies and other vermin. It is believed that the removal of the out-house to a new pit from time to time will entirely solve that problem of sanitation.

Health Department Organization

The expense to the city of Pensacola for all sanitary cleaning is about $9,425 per year. The area of the city is 12 square miles. A particularly favorable contract was made for refuse collection for this year. There has recently been established a Public Health Unit in charge of a U. S. Public Health Service doctor with a full complement of trained inspectors, two nurses, milk, meat and dairy inspector and a doctor who will devote his full time to the indigent sick.

A Well-built Small Plant for Sewage Disposal

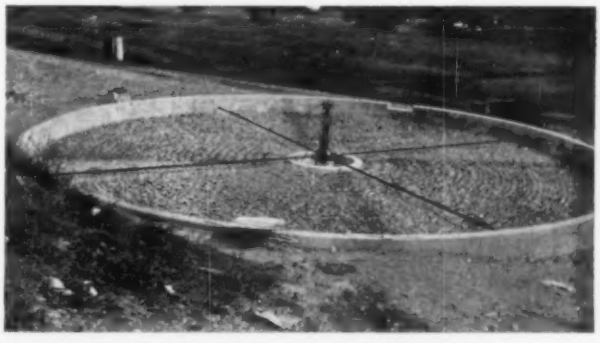
Disposal Unit Serving a College Cares for All Community Service

By **W. MARTIN JOHNSON**
Sanitary Engineer, Wiley & Wilson, Consulting Engineers, Lynchburg, Va.

THE small stream flow in Carvins Creek, a tributary of the Roanoke River into which the sewage of Hollins College, eight miles north of Roanoke, Va., was discharged, necessitated treatment of the sewage for the entire college community. Until the installation of the new sewerage system and sewage disposal plant, the greater part of the sewage flowed directly into the creek without treatment, at a distance of about 800 feet from the campus. With reduced flow in Carvins Creek, owing to a large dam for an impounding reservoir about 1½ miles above the College, and the possibility of further drought conditions, the College authorities commissioned Wiley & Wilson to make a survey and recommendations for necessary sewage treatment.

Location Selected

Four possible locations were considered. One site was to the northwest of the College, a second to the south, and a third and fourth approximately 4,000 and 7,000 feet respectively below the College. At any of these locations it would have been necessary either to pump the raw sewage, or to pump at some stage of treatment. The last



THE ADAMS REVOLVING SEWAGE DISTRIBUTOR FOR THE HOLLINS COLLEGE COMMUNITY, NEAR ROANOKE, VA.

THE CHLORINE HOUSE AND GLASS SLUDGE BED COVER

two locations were abandoned because of the distance and the necessity of acquiring rights-of-way and property for the plant site. The first site was abandoned because the prevailing direction of the wind was toward the main group of College buildings. The site selected is approximately 900 feet from the nearest College buildings and is on a hillside to the rear of an old B. & O. Railroad fill to the west of the Lee Highway.

Operation of the Plant

The pumping station is located on the north bank of Carvins Creek about 500 feet from the campus proper. Sewage reaches this point through an 8-inch trunk sewer which carries all the sewage from the institution. A duplex installation of Jennings pneumatic sewage ejectors, each having a capacity of 100 g.p.m. is located in a pit within the concrete and brick pumping station. The compressor motors are operated by 440-volt, 3-phase current. The sewage is pumped through an 8-inch cast iron main laid under Carvins Creek and thence underground to the plant, discharging directly onto sloping bar screens consisting of ¼- x 2-inch bars spaced 1¼ inches center to center. The screens are for the removal of sticks, fruit skins, rags and other coarse material not readily digested in the Imhoff tank.

The screened sewage then passes into the sedimentation chamber of the Imhoff tank. Two sets of baffles and a scum board at the outlet give a well-clarified effluent. The solids settle through slots at the bottom of the sloping walls into the sludge chamber below, providing 2.75 cubic feet sludge storage capacity per capita. The gases rise to vents at the sides of the tank, these vents being equipped with water-sealed removable gas collectors. The gas will later be piped to a burner or to a heater within the chlorine house. Gas-floated scum is held below the water under the gas hoods by removable screens. The sedimentation chamber has a concrete cover with steel plate access openings through which the sloping walls may be cleaned.

The tank effluent flows into a dosing tank equipped with an Adams low-draft siphon, there being only 18 inches difference between the maximum flow line in the siphon chamber and the surface of the filter media.

The siphon discharges into an Adams revolving sewage distributor. This distributor consists of a fixed central vertical shaft about which revolve the four distributor arms suspended from the top of the shaft and resting on ball bearings and guides. The bottom casing around the shaft is divided into two vertical circular chambers in which are suspended the two revolving chambers separating the inner and outer fixed ones by an air lock, thus preventing the overflow of sewage and providing a frictionless seal. The sewage flows in at the bottom of the center chamber up through ports into the four horizontal distributor arms, which discharge the liquid through jets 6 inches above the filter stone. The jet action thus produced provides the power for revolving the distributor. As the distributor rotates, the sewage is spread in a thin film uniformly over the surface of the bed. This is the first installation of this type of equipment in the South. It was only after careful investigation of plants in the Middle West where this type of distributor was used, that the installation was made. The equipment was supplied by Francis Hankins & Co., Ltd., of Montreal, Canada.

The distributed sewage filters through 6 feet of 1½- to 3-inch limestone from which all fine stone and dirt has been removed to an underdrain system of terra cotta tile resting on a concrete floor. The effluent drains to a center well before flowing to the final sedimentation tank. The walls of the filter bed are of concrete, and provision is made for flooding the bed in case of nuisance from the psychoda fly.

The final sedimentation tank is of concrete with a hopper bottom for sludge collection. A skimming board just ahead of the overflow weir removes the effluent in a thin film free of scum. The Imhoff and final tanks each provide 1¾ hours sedimentation period. The sludge from the Imhoff tank and final tank can be drawn by gravity into drying beds covered by a Hitchings standard greenhouse. The filter media of these beds is 32 inches deep, consisting of layers of sand, gravel and stone with terra cotta underdrains resting on a concrete floor. The filtrate flows into the outfall line from the final tank to Carvins Creek.

Sterilization and Chemical Treatment

The raw sewage is treated with chlorine just ahead of the screens, and this dosage is giving excellent results for odor control. Final chlorination is effected by introducing chlorine into the trickling filter effluent just ahead of the final tank, and is for the purpose of bacteria and odor control. The chlorine is fed through a W. & T. vacuum type solution feed chlorinator.

Tests are run daily and results recorded of pH values at the sludge line of the Imhoff tanks, residual chlorine and settleable solids in the Imhoff tank and final sedimentation tank effluents, and the relative stability of the final effluent. The quantity of lime and chlorine used is also recorded, as well as the quantity of sewage treated and sludge drawn. The laboratory equipment is kept in the chlorine house.

The grounds around the plant are graded and shrubbery and grass have been planted. The State Department of Health, through its Sanitary Engineer, Major Richard Messer, and staff, assisted in seeding the Imhoff tank and in placing the plant in operation.

BIDDING ON INTEREST RATES

DURING 1931, according to the New York State Bureau of Municipal Information, 58 municipalities permitted prospective purchasers of bond issues to bid on the rate of interest; 22 others from which this information was sought did not permit this, but required bids based on a fixed interest rate.

Novel Handling of Traffic on Viaduct Approach Plaza

By L. SEGOE
Consulting Engineer and City Planner, Cincinnati, Ohio

UNUSUAL design and traffic control are used on the western approach plaza of the Western Hills viaduct in Cincinnati, which was opened to traffic on January 16, 1932.

This viaduct, costing about 3½ millions of dollars, was built as a part of the Union Terminal project to take the place of two inadequate viaducts and two streets that crossed the valley of Mill Creek and several railroad tracks at grade. It furnishes the principal entrance to the central district of a large, fast-growing section of the western sector of the city, and is a most important link in the city's major street system. Its location, type and dimensions were determined after thorough studies of the major street system, and on the basis of careful traffic checks, their analyses, and a prognostication of future requirements.

A general view of the viaduct is given in Figure 1. It was designed as a double-deck structure to provide for the segregation of slow and fast-moving traffic: trucks and street cars on the lower deck, passenger cars and busses on the upper deck. The latter, 3,500 feet long, connects at its eastern end with Central Parkway, a boulevard from 110 to 150 feet wide, built on the right-of-way of the abandoned Miami and Erie Canal, and now the principal entrance to the downtown district from the northern sections of the city. The lower deck connects at its eastern end with Spring Grove Avenue, an important thoroughfare 100 feet wide, which serves a large industrial and freighthouse district. At the western end all vehicular traffic enters and leaves both decks of the viaduct over the western plaza, the lower deck being connected with it by means of two ramps on the sides of the upper deck. Street cars stay below the plaza and rise to the surface of the approach streets by ramps in the center of these streets.

The roadways of both decks are 40 feet wide. Sidewalks, 6 feet wide, have been provided only on the upper deck. The viaduct consists mainly of concrete and concrete-cased steel girder spans. The two arches, one over Mill Creek and the other over Spring Grove Avenue, have spans of 109 and 120 feet, respectively. The lighting system installed on the upper deck is quite unusual, consisting of lighting units placed in the balustrade and throwing the light horizontally across the roadway from both sides.

Unique features of design and traffic control, of more than local interest, are used at the west plaza of the viaduct, shown in Figure 2.

Advantages of This Method

The requirement of connecting the approach streets with the viaduct by means of easy curves, and the need for unusual street widths to provide for the street-car and truck ramps to the lower deck, resulted in a plaza about 200 feet wide at its widest point. The handling of vehicular traffic to and from both decks of the viaduct across this sizable plaza, so as to secure the maximum traffic handling capacity and the optimum in safety for both motorists and pedestrians, presented the problem. After considering several plans, including a traffic circle, the plan employing a number of islands in combination with a flexible progressive method of traffic control, shown in Figure 3, was adopted and carried out.

There are four islands within the plaza, their shapes determined by tracing the most direct routes of all traffic movements across the plaza. The flexible progressive method of traffic signal operation was applied to this physical layout by the installation of ten vehicular signals and twelve separate pedestrians' signals, combined into one system and so timed that in addition to providing for progressive operation it separates all conflicting movements. This is shown in Figure 3. The advantages of this design and method of traffic handling may be stated as follows:

FIGURE 1.—GENERAL VIEW OF WESTERN HILLS VIADUCT, CINCINNATI

1. The channelization of traffic, which insures orderly and the shortest possible movements across the plaza, by withdrawing from use all superfluous roadway space.
2. The possibility of employing in the handling of traffic so channelized a flexible progressive traffic signal control that insures continuous flow and segregates all conflicting movements.
3. The creating of reservoirs between the islands, adjacent to areas used by conflicting traffic movements, where vehicles can accumulate during the "stop" period and thus utilize every second of the "go" period to clear the areas of conflict (instead of using part of it to get up to such areas), thus increasing the traffic handling capacity of such areas of conflict.
4. The islands offer places of safety to pedestrians crossing the unusually wide roadways, and reduce the length of the "go" period that must be allotted to pedestrians during each cycle and, correspondingly, the length of the "stop" period for vehicular traffic.
5. The islands provide locations necessary for the lighting units and for the traffic signals.

The location of the traffic signals and the system of lane marking used are shown in the upper part of Figure 3.

The timing diagram was prepared months ahead of the opening of the viaduct, on the basis of a traffic flow diagram (which itself had to be reconstructed by an analysis of traffic counts on the streets and viaducts the new viaduct was to supplant), and has been changed in only one particular since the viaduct was opened to traffic, the total cycle being reduced from 70 to 60 seconds. The timing equipment consists of one master timer, one three-period and four two-period timers.

The plaza has been in operation since January 16, and may now be declared an entirely satisfactory solution of the problem. Although the arrangement was considered by some who have seen the plans as rather involved, in actual use the drivers did not appear to have any difficulties in following the signals, and after an educational period of two weeks the single policeman assigned to this location was also withdrawn.

FIGURE 2—WEST PLAZA OF VIADUCT

There were no indications of congestion and no accidents, in spite of the very large number of motorists who came to see the improvement immediately after the opening.

The viaduct was designed and built by the Cincinnati Union Terminal Co. as a part of the Passenger Terminal development in charge of Colonel H. M. Waite, Chief Engineer. It was financed jointly by the Terminal Co., the Baltimore & Ohio Railroad Co. and the city of Cincinnati. The location and general plans of the viaduct and the detailed design of the west plaza and the traffic arrangement were prepared by the writer for the Terminal Co. The traffic signal installation was made by the Crouse-Hinds Co., of Syracuse, N. Y.

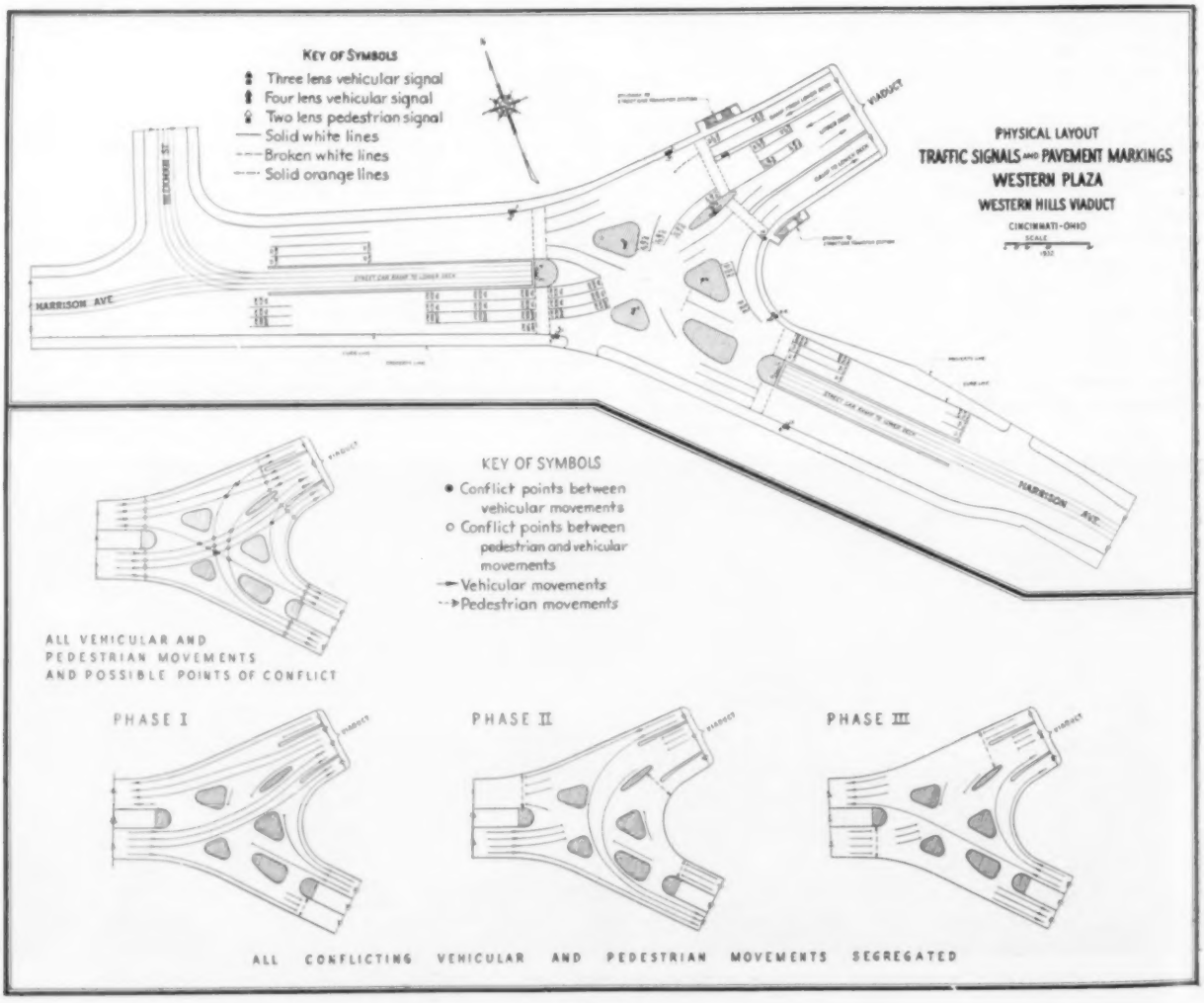


FIGURE 3

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz, P. J. Stupka, Donald M. McNeil

Index Numbers for Comparing Traffic Accident Statistics

T. T. McCROSKY, Planning Director, city of Yonkers, N. Y., has recently suggested what he believes to be a more satisfactory yardstick for comparing traffic accident records than the more common method of calculating the number of accidents per 1,000 population, or per 1,000 automobiles, or otherwise.

He suggests that an index number be computed by giving to each of the three following factors a weight of 33 1/3 per cent: (a) accidents per 1,000 population; (b) per 1,000 automobiles; and (c) per mile of street. The index number for the "standard city," representing average conditions, is taken at 100.

The application of the index is shown in the following tabulation which compares the records of four Connecticut cities, based upon data furnished by Professor Richard S. Kirby, Yale University, who yearly makes a complete analysis of Connecticut traffic accident statistics under the sponsorship of the Hartley Corporation:

TRAFFIC ACCIDENT INDEX NUMBERS

City	1930 Population	1930 Automobile Registrations	Miles of Public Street	Accidents: No. of Traffic Accidents	Accidents: Per 1,000 Population	Accidents: Per 1,000 Automobiles	Accidents: Per Mile of Street	Composite Index No.
Bridgeport	147,206	25,972	202	1,895	12.9	73	9.4	98
Hartford	163,849	31,706	190	2,027	12.4	64	10.7	98
Waterbury	101,107	15,549	210	1,000	9.9	64	4.8	70
New Haven.....	162,600	28,556	214	2,001	12.3	70	9.4	96

Wilmington Traffic Survey Gives Employment

A COMPREHENSIVE traffic survey of Wilmington, Del., is being conducted by the Mayor's Employment and Relief Committee under the auspices of the Delaware Safety Council. The survey is one of a number of projects for furnishing employment and at the same time bringing about worthwhile improvements of lasting value to Wilmington.*

The entire personnel for the survey is recruited from those registered for employment at the joint offices of the United States Employment Service and the Delaware State Employment Service. Engineers, clerks, salesmen, and others especially fitted for traffic survey work comprise the staff. Among the workers are some who are physically unable to do manual labor or perform the heavier tasks involved in other projects of the Mayor's Employment and Relief Committee.

An old schoolhouse has been fitted up as the survey headquarters. The necessity for adequate direction and supervision has been recognized. The proposed program, which is subject to adjustments as the survey proceeds, includes the following studies:

1. *Parking study*, primarily of the central business district. This will include studies of street parking, and of parking in garages and lots.

2. *City-wide vehicular volume distribution count.*

3. *Pedestrian study*, primarily in the central business district.

4. *Speed and delay study* for both free-wheel vehicles and street cars, on major arteries.

5. *Mode of transportation study.*—This will comprise a cordon check to determine how persons enter the central business district, and a study of transportation used by customers and employees of selected central district businesses.

6. *One-way streets and turns*, primarily but not exclusively in the central district.

7. *Study of street-car routing, stops, lay-over points, etc.*

8. *Study of bus and taxicab problems.*

9. *Safety zone study*, giving especial attention to certain central district problems; also considering design; locations now in use; locations most in need of safety zones.

10. *Accidents and their prevention.*—Superintendent of Police Black has for some years been having excellent accident records made. These will be filed by location and otherwise "put to work." Thorough analyses will be made concerning "worst" accident locations, and remedies will be devised. A special study will be made of school-child safety.

11. *Through "Stop" streets.*—A complete system of through "Stop" streets will be laid out after thorough study.

12. *Traffic control signals.*—This study will include the setting-up of minimum standards for signal installation; study of existing signals as to their appropriateness, timing, location, operation; study of possible signal systems; study of efficiency of different types of control.

13. *Standardization of signs, signals, and markings.*

14. *Study of observance* of reflector "Stop" buttons or mushrooms, traffic control signals, certain traffic regulations.

15. *Special problem locations.*—Studies of certain locations where various types of special problems exist. One such study will be of circulation, parking, bus and taxicab stands in the vicinity of the Pennsylvania R. R. Station.

16. *Study of traffic administration.*—Organization, methods, etc.

17. *Traffic laws and regulations.*—This study will include analysis of the Delaware Vehicle Code in the light of Wilmington's needs and of conformity to the national Uniform Vehicle Code. It will also include study of Wilmington's traffic regulations and needed changes, giving due account to the national Model Municipal Traffic Ordinance.

If funds permit, it is planned to conduct an origin-destination study, and to develop recommendations for a major street plan.

A splendid spirit of cooperation toward the survey exists among the municipal departments most interested. Various business and civic groups, including the newly appointed Traffic Commission, are much interested in the survey.

The Mayor's Employment and Relief Committee has allocated $25,000 for the traffic survey. This sum is to cover expenses incident to payrolls, printing and supplies, heat and light, technical advice, and the preparation and printing of the report of findings and recommendations.

* Executive direction is the responsibility of the Delaware Safety Council, with H. P. Young as Traffic Engineer. Staff principals are: Planning Engineer, A. H. Alcott; Field Work Engineer, H. A. Blickle; Statistical Engineer, Robert Stewart; Drafting Engineer, William Johnson; Accident Engineer, G. A. Flink. Burton W. Marsh, Vice-President of the Institute of Traffic Engineers, is acting as Technical Adviser.

Officials of the Mayor's Employment and Relief Committee are: Frank A. McHugh, Chairman; T. W. Wilson, Vice-Chairman; F. E. B. McCann, Assistant Chairman and Secretary; Henry P. Scott, Treasurer; John J. Haley, Supervising Engineer.

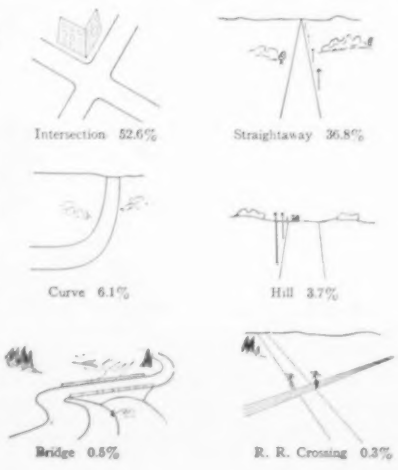
The Public Accidents Committee of the Delaware Safety Council, of which Dr. C. M. A. Stine is Chairman, will review all forms used and data collected in the survey. Manager Walter Dent Smith of the Safety Council is also a member of the Executive Committee of the Mayor's Employment and Relief Committee.

Connecticut Motor-Vehicle Statistics for 1931

THE Research Section of the Connecticut Department of Motor Vehicles has recently issued its annual accident analysis, showing the third successive yearly decrease in number of accidents. There was also a reduction in accidents involving injuries to persons, but fatal accidents were greater than in any previous year. All accidents decreased about 13 per cent and personal injury accidents about 2 per cent, while fatal accidents increased 12 per cent and the number of victims 16 per cent.

The drawings reproduced below are taken from the report to show the novel means used to assist in visualizing the locations at which accidents occurred.

Conditions Under Which Accidents Occurred



CONDITIONS UNDER WHICH ACCIDENTS OCCURRED IN CONNECTICUT—1931

Location	Per Cent Total Accidents	Per Cent Fatal Accidents
Intersection	52.6	29.0
Straightaway	36.8	56.6
Curve	6.1	8.1
Hill	3.7	2.7
Bridge	0.5	2.3
Railroad crossing	0.3	1.3
	100.0	100.0

The accompanying figures show the percentage of total and fatal accidents chargeable to each place.

Sixth Annual Traffic Survey Completed in Rochester

WITH the cooperation of the Monroe County Planning Board and the Boy Scouts of Rochester, N. Y., the Rochester Engineering Society has completed its sixth annual traffic survey. The work was directed by the Traffic Committee of the Engineering Society, of which Leon R. Brown, a member of the Institute, is Chairman.

Three cordon counts were taken; one at the city line, one at the limits of the central traffic district and one at an intermediate point. Additional traffic counts were made throughout the city and Monroe County, and at the main traffic points in five surrounding counties.

A large number of pedestrian counts were made; vehicles were tallied at all new and proposed traffic signal locations, and on all bridges. A check was also made of "boulevard stop" violations. A comprehensive survey of curb and off-street parking facilities and use was an important part of the survey.

No publicity was given prior to the survey, so that there would be no difference in police enforcement or motorist obedience while it was in progress.

Motor-Vehicle Accidents Vary with Intensity in the Enforcement of Traffic Laws

By **DONALD M. BAKER and WILLIAM H. BAKER**
Consulting Engineers, Los Angeles, Calif.

A RECENT study made by the writers covering motor-vehicle accidents, injuries and deaths which occurred in the city of Los Angeles during the three years 1929 to 1931, inclusive, has brought out some very interesting facts, and appears to warrant the statement that motor-vehicle accidents, deaths and injuries vary with the intensity with which traffic laws are enforced, as well as with such factors as allowable speeds, intensity of motor-vehicle registration, number of safety devices, etc.

The density of motor-vehicle registration in Los Angeles is greater than that of any other city in the country, there being 2.4 persons for every motor vehicle registered in the city. This compares with 7.7 persons in New York; 9.2 persons in Chicago; and 11.1 persons in Philadelphia. Favorable climatic conditions encourage a year-round usage of automobiles, with increased annual mileage per vehicle, and likewise higher accident rates. Such climatic conditions do not result in annual variations of traffic such as occur in eastern cities with more rigorous climate.

Speed limits are controlled by the California Motor Vehicle Act as follows:

Business district.....20 miles per hour
Residence district.....25 miles per hour
Open road.....45 miles per hour

Arterial highways are protected by "Stop" signs, and about 600 traffic signals have been installed at important intersections. Much educational work has been done in schools and through the press, but a high accident, injury and death rate still prevails. The following statistics are for the 36-month period commencing January, 1929, and ending December, 1931:

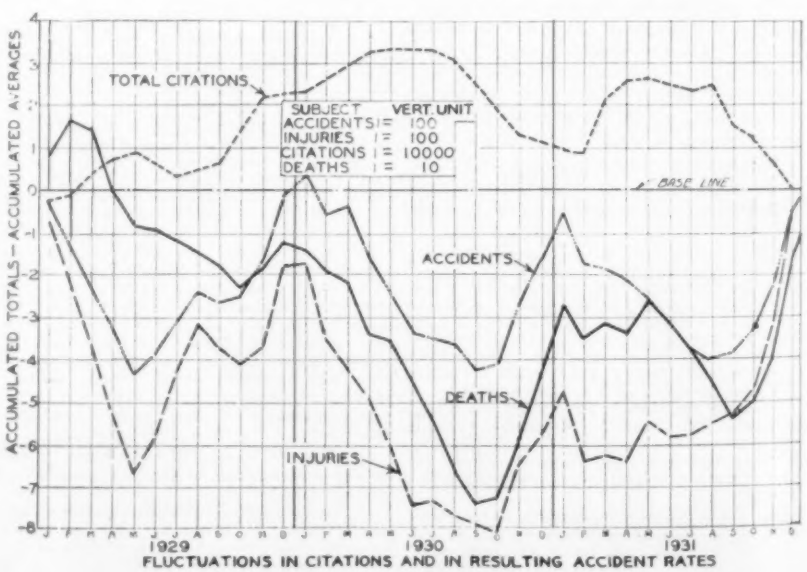
	Average per Month	Maximum Month	Minimum Month
Accidents	1,045	123.0%	87.3%
Injuries	1,357	120.9	84.8
Motor-vehicle deaths	36.5	156.6	66.7
Traffic citations	18,280	165.0	57.6

The average accident and injury rate has been fairly consistent through the three years. The death rate has increased and the rate of traffic citations has decreased during that period. Citations for traffic violations are taken as a measure of the rate of enforcement. While certain violations are not conducive to accidents or injuries, nevertheless, total citations do show a measure of intensity of enforcement.

The figure shown herewith is more or less self-explanatory. It has been arranged as a residual mass diagram rather than showing actual monthly totals, for such an arrangement brings out the trends more plainly. An upward slope of the line indicates a rate of enforcement greater than the monthly average for the period, and vice versa. The graph does not show any particular seasonal variation either in accident rates or in citations, but rather a cycle.

Mounting deaths and accidents cause public clamor for stricter enforcement, and following this the accident and death rate is reduced. The public then forgets, enforcement becomes lax, accident and death rates commence to increase, and the cycle continues.

The essential thing appears to be a continuous and consistent enforcement rate which will instill in the public mind the fact that every violation will subject the driver to a very probable citation. The sensitiveness with which the accident rate responds to increase in enforcement would indicate that consistent and continuous enforcement will bring down casualties to a minimum figure.



THREE-YEAR RECORD OF MOTOR-VEHICLE ACCIDENTS, INJURIES AND DEATHS IN LOS ANGELES

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Cleveland Encourages Picnics in Its Parks

CLEVELAND, OHIO.—With a background of four years' experience, the Picnic Bureau of the Department of Parks and Public Property expects this summer to serve more organizations than in any previous year. Industrial, fraternal, church, neighborhood, and other organizations make use of the Bureau's service. Since 1928 assistance has been given to 991 picnics, attended by more than 680,500 people. The average attendance at these picnics was 662.

The Bureau lends certain non-perishable equipment which a majority of the groups cannot afford to purchase. The recreation staff also confers with the picnic committees of the various organizations and works out programs with new picnic stunts. This service saves hours of time on the part of the committees. In many cases leaders are supplied at the expense of the group. They work with the committees and officers of the group, who for the most part are novices, and relieve them of the hardest part of the management of the program. The leaders keep the program moving, anticipate the next event, organize the groups for each event and teach them how it is conducted. During the past four years 444 leaders have been thus assigned.

DAN W. DUFFY,
Commissioner of Recreation.

EDITORIAL NOTE.—The National Recreation Association, in the Year Book number of *Recreation* (May, 1932) reports that 189 cities have special picnic service. Additional information about this service and other special recreation activities may be obtained from the Association, 315 Fourth Avenue, New York, one of whose recent publications is "Picnic Program" (15c).

Regional Planning Commission Saves Large Sums in Highway Development

LOS ANGELES, CALIF.—Regional planning in Los Angeles County is in a very satisfactory position. The continued support which is given this work by the people and governmental officials of Los Angeles County is due in large part to the ability of the Commission, under the leadership of Director Charles H. Diggs, to give proof of actual cash savings to the taxpayer resulting from its operation.

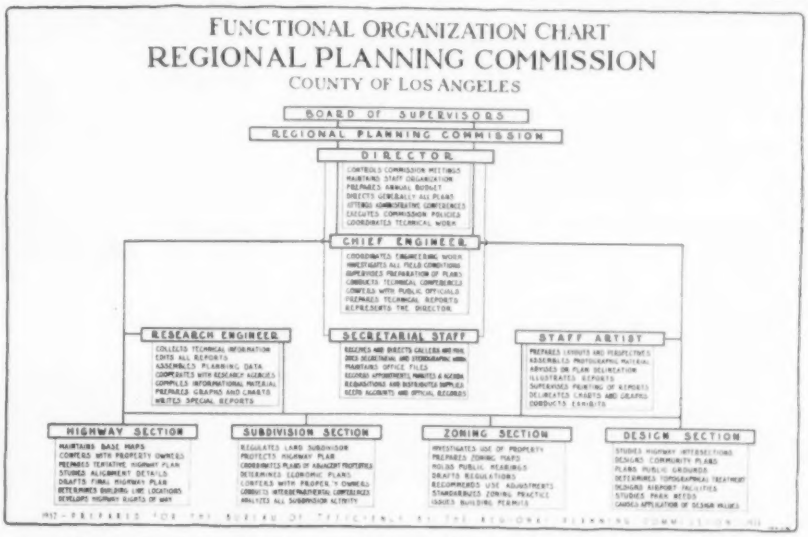
Every one knows that many of the benefits of planning activities are more or less intangible, coming in the form of future social betterment and preparation for improved living conditions, but, aside from all these, there are, where planning is properly guided, definite, demonstrable savings.

A survey of the Highway Section alone shows that during the nine years of this Commission's existence 165 miles of full-width major and secondary highway rights-of-way were acquired by reason of the comprehensive highway plan and the efforts of the staff. Had there not been a Regional Planning Commission, such highway rights-of-way could not have been acquired as they were. During the same period the Auditor's books show that the county condemned only 24.6 miles of main highway rights-of-way, at a cost of $118,000 per mile! At this rate, the 165 miles secured through this department's plans and efforts would have necessitated an expenditure of $19,470,000 to be charged back to the property owners in the form of special assessments. But the entire budget of the Regional Planning Commission since its creation nine years ago has averaged only $50,000 per year. Dividing this into the several million gained annually through the application of our highway plan alone, shows a definite tangible saving as represented by the county's own audit, of $40 for every dollar expended.

To state the same thing in another form, we may say that the cost per mile of acquired land for highway rights-of-way through planning is less than one-tenth of one per cent of the cost under condemnation proceedings, and that the process from the point of view of results secured is more than six times as effective. When these savings are compared with the low cost of operation of the Commission, only two cents on each thousand dollars of valuation, it is easy to understand why the people of Los Angeles County are not in favor of any reduction in this service. It should be further noted that condemnation proceedings in the county are now at a complete standstill because the heavy burden they place upon the property owners has rendered the bonds unsalable.

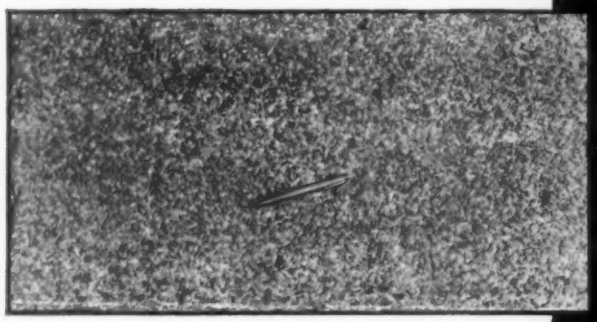
It is true that where land is condemned at an average of $118,000 per mile, some of the persons who pay for it are the same ones who receive the money for the purchase of the rights-of-way. Usually, however, the person who recovers the award soon sells out, and the buyer pays the seller for the increased value by reason of the wider street, and then finds he has the obligation of the assessment, which is paid with his taxes on an ad valorem basis over a period of from twenty to thirty years. Obviously, he pays twice. Then, too, the district usually extends some distance back from the frontage in question, so that many of those who have to help pay receive no compensation, with no direct benefit.

Also, the cost of proceedings forms a very material part of the total assessment, and it must be remembered that since bonds have to be sold to meet these costs of acquisition, the interest charges, which would tend to double the figure given, have to be met by additional assessments. When every allowance has been made for the necessarily generalized form in which these figures are given, there still remains a very obvious advantage in a method which avoids entirely these costly proceedings.



The policy of the Commission, since its organization, has been to require, as a condition for giving its approval to new subdivisions proposed for record and sale, that full dedication be made of all major and secondary highways called for in the Regional Plan of Highways as prepared by the Commission. Furthermore, the Commission has prepared, and the Board of Supervisors has adopted, ordinances establishing building of lines along many miles of these highways, and voluntary dedications of the extra width needed for highways have been secured in a great many places even where no subdivision was involved. All of this has been accomplished, not through any arbitrary power, or assumption of power, but simply by handling each case on its

Surface texture on Bitumuls Retread



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Containing no slow-drying solvents or oils, Bitumuls develops the full strength of pure asphalt in a very short time after mixing—and the road is durable from the start.

Due to its great fluidity, Bitumuls mixes easily with less manipulation than other binders. Therefore, construction costs are low.

Construction can be performed with ordinary tractors, road maintainers, graders, farm harrows, or wooden drags—at low labor and plant costs. A distributor for spreading the bituminous binder, and a road roller, are the only special equipment required.

Discuss this modern development, or any of your paving problems, with a Bitumuls field engineer. Facts are also available in Bitumuls Bulletins. Write for a set. American Bitumuls Company, Dept. 4, 200 Bush St., San Francisco, California. Other factories and offices: Boston, Baltimore, St. Louis, Baton Rouge, Los Angeles, and Portland, Oregon.

Bitumuls retread on a Tompkins County road, New York State. Thickness varied from 1 in. to 4 in., to even up depressions in old base.

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merits, and developing a universal respect for the Plan as a vital community asset.

The problems of county planning are more important now than ever before. Much more careful analysis must be made of each project than was possible when community growth and the subdivision of land were so abnormally rapid. Those portions of the County Plan which have been completed and approved involve very careful guarding to see that the recommendations are not misused. It is believed that this program of operation, if adhered to, will continue to save the taxpayers of Los Angeles County enormous sums in the years to come.

BRYANT HALL,
Research Engineer, Regional Planning Commission.

Pistol, Rifle and Trapshooting Facilities in Park System

UNION COUNTY, N. J.—Five years' experience has demonstrated the popularity of the trap-shooting facilities introduced in the Union County Park System in accordance with the Park Commission's policy of providing the maximum possible in outdoor recreational facilities, and in response to popular demand, led by the Union County Fish and Game Association. An accurate file of shooting records shows that approximately 500 different gunners use these facilities annually, drawing more than 5,000 spectators.

A suitable site was selected in Cranford, centrally located in the county, in a 300-acre tract along Normahiggin Brook and the Rahway River, which is destined to remain in its natural state for some time, other projects having priority on the development program when funds become available. Three traps with a standard layout of platforms and walks to accommodate fifteen gunners at one time have been provided, together with parking facilities for cars, seats for spectators and a field house where refreshments may be obtained and guns rented. The cost of this layout, exclusive of land, was under $2,000. Ammunition is sold at prevailing prices, and these sales, with those of the clay targets which are purchased by the Park Commission in carload lots, make this wholesome outdoor recreational activity self-supporting.

The traps are open Saturdays and Sundays all the year round, and on other days when matches are scheduled and prior to the hunting season. The annual Union County Trapshooting Championship tournament, other matches and special events have developed considerable interest in the sport.

The rifle and pistol range adjoining the traps was opened in 1930 and has become equally popular. The range occupies three acres and cost approximately $6,000. The 10 targets are backed by heavy steel plates with 10 firing points at each of the following distances: 50, 100, 150 and 200 yards. High-powered rifles are not permitted, subcaliber only being used. A range officer is in charge when the range is open, and every precaution has been taken to guard against injury. Firing is done from the prone position and through openings so protected that a bullet cannot go astray. Furthermore, rifles must be loaded with the barrel in one of the openings.

The Union County Rifle League has been organized and is in successful operation. One of these teams in a regular scheduled match scored 990 out of a possible 1,000. Junior matches for high school boys and girls are fast growing in popularity. Some of the girls are excellent shots.

Various municipal police forces in the county derive much benefit and pleasure in the weekly matches of the Union County Police Pistol League, and the improvement in marksmanship and hence in the efficiency of these officers is noteworthy. The average for the entire force of the Park Police is over 80 per cent for the year 1931. Many reserve officers, national guardsmen and bank employees are given pistol instruction.

W. R. TRACY,
Engineer and Secretary, Union County Park Commission, Elizabeth, N. J.

Hunting and Fishing as Municipal Recreation

DALLAS, TEXAS.—This city entered a new field of municipal activities in its efforts to develop opportunities for outdoor recreation and sports when it recently established a fish hatchery at a cost of $18,000. Its present capacity is 1,000,000 to 2,000,000 fish per year. The fish are ready for distribution to municipally owned and controlled waters. It is planned to plant some 500,000 bass, white perch and bream in White Rock Lake, this fall.

Lacking natural lakes, and depending largely on the irregular flow of the Trinity River for its water supply, Dallas has built two large artificial reservoirs, White Rock Lake and Lake Dallas, and several smaller reservoirs. White Rock Lake, covering 1,600 acres and storing 6 billion gallons of water, is within the city limits and is now used for recreation purposes exclusively. Lake Dallas is 30 miles away, but is easily reached, by good highways. This larger lake covers 11,000 acres and has a capacity of 70 billion gallons.

Six miles west of the city limits another lake, covering 4,250 acres, is being built by a power company as a cooling reservoir for a large steam power plant. The recreational features of this lake wil be under the jurisdiction of the park system.

Along the Trinity River between the city and Lake Dallas are several dams which form small lakes. These reservoirs and a body of water close to the city, known as Bachman's Lake, were provided a number of years ago as sources of water supply. The need of them has been supplanted by Lake Dallas. Bachman's, the largest of these minor bodies of water, holds 440,000,000 gallons. Surrounding it is a wide park area, all owned by the city. These bodies of water are depleted of fish more rapidly than the state hatcheries can replenish them. The city has therefore undertaken to provide its own supply.

As one part of the development of a fisherman's paradise at White Rock Lake, the Park Board is arranging for new piers for the convenience of anglers and for planting waterlilies and native moss for fish cover and feed. A fishing pier 800 feet long was recently constructed on top of a sewer and a water line crossing the northeast end of the lake, converting an eyesore into a thing of beauty and new usefulness.

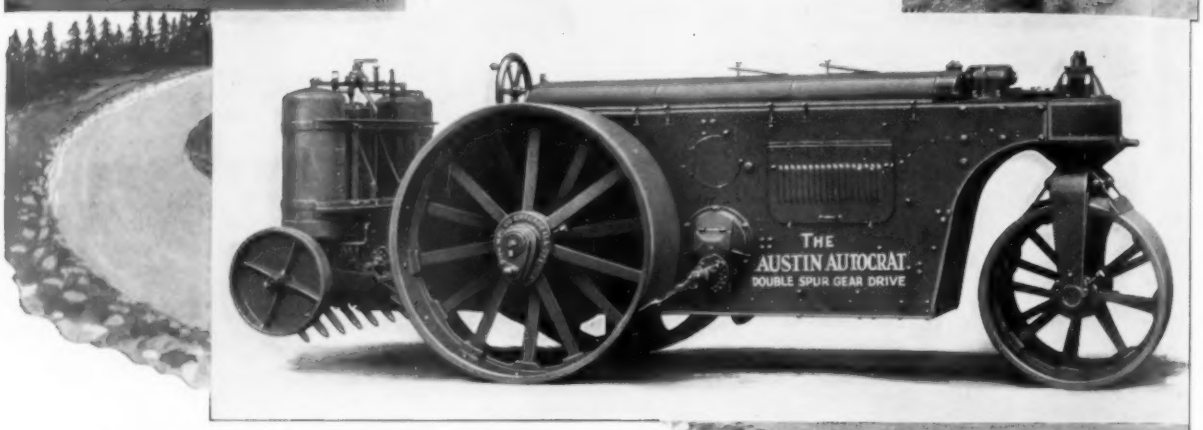
The development of White Rock Lake was undertaken only after careful planning. Among its major improvements is a concrete bathing beach and bathhouse. The beach is 600 feet long and runs out into the water 150 feet. The entire bottom is a 6-inch concrete slab. On another part of the shore is a concrete boathouse of thirty stalls, municipally owned and operated. Circling the lake is a boulevard fifteen miles long, and around the border of the lake, near the road, are tennis courts, baseball diamonds and picnic facilities. Native trees have likewise been planted.

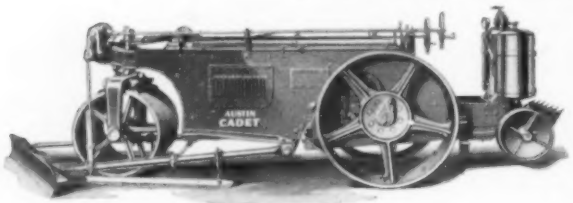
WALTER C. HORNADAY.

CRANFORD, N. J., RIFLE RANGE, UNION COUNTY PARK SYSTEM

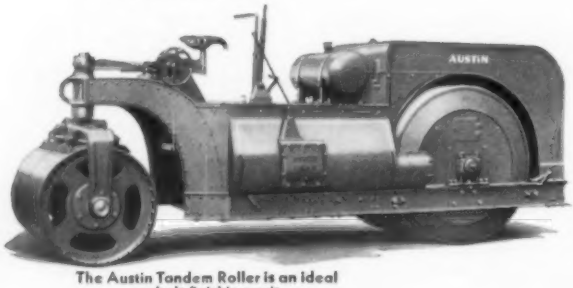
Two Austin Autocrat Rollers at work on a modern highway. The Autocrat is the "Rolls Royce" of rollers.

The pneumatic scarifier on the Austin Autocrat is capable of tearing up the hardest, worn-out roads.

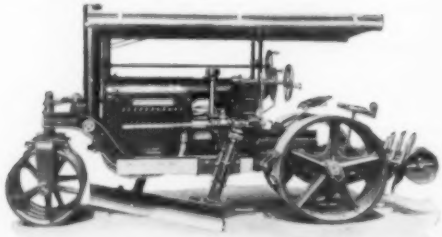




The Austin Cadet Roller fitted with a front planing blade and powerful pneumatic scarifier.



The Austin Tandem Roller is an ideal asphalt finishing unit.



An Austin Bull Pup Roller, with center blade and rear scarifier.

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ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS. MOTOR GRADERS, PLOWS & SCRAPERS, ROAD OILERS, ROAD DRAGS, CULVERTS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

Effective Regulation of Outdoor Advertising

SCARSDALE, N. Y.—While many a community has sensed the value of a picturesque heritage, comparatively few of them have been so successful in this attempt as Scarsdale, in Westchester County. Scarsdale has found out that esthetics are worth developing in this commercial age, and that an attractive business center pays material dividends as well.

Protected by building and sanitary codes and zoning ordinances, and other effective rules and regulations, and by well-managed municipal departments, the village has attained during these latter years a well-developed civic pride. Attempts have been made to break down the standard, but the village officials have been firm in carrying out the wishes of the residents that Scarsdale remain a village of homes.

STREET IN SCARSDALE, N. Y., WHERE UNSIGHTLY OUTDOOR ADVERTISING IS PREVENTED

Scarsdale was settled in 1701, but only in comparatively recent years has this territory of vast estates and scattered country homes and farms become a modern suburban section, with an assessed valuation of real estate approximating $65,000,000 in its 6¼ square miles. The business centers, carefully zoned about the railroad stations in the village, stand out not only for their architectural appearance, but to a more marked degree for the absence of the common, blatant advertising sign that so often characterizes a development of this type. This restriction is carried in principle throughout the entire village, and its highways and streets, with no billboards, placards, or posters affixed to trees, fences or poles, offer welcome relief to the passerby. Nor are its streets cluttered or its homes bothered with throwaways or other forms of cheap advertising. Signs of business establishments are prohibited from projecting over sidewalks, and the often disfiguring electric flashing advertisement is not practicable.

The handbill and billboard ordinance, adopted on February 1, 1928, has proved adequate for the past four years. It bears emulating in other communities that are plagued by an overabundance of "advertising." The ordinance follows:

Section 1: No person shall post, attach, or display any sign, notice, placard, poster or other advertising media to or upon or over any sidewalk, tree, stone, fence, wall, pole, railing, or other object, in, along, upon, or over any street, park or public place within the village of Scarsdale, except upon public bulletin boards provided by the village of Scarsdale.

Section 2: No person shall erect, construct, maintain or use, within 50 feet of any street, park or public place, on any vacant premises, or on the exterior of any building, any sign, placard, or other advertising device or medium, artificially illuminated by gas, electricity, or otherwise, except that such sign may be attached to a business building provided it is constructed parallel thereto and not higher than the ceiling of the first story of said building, and provided that such sign shall not have an area of more than 25 square feet, and provided that the illumination of such sign shall be constant while lighted, and in no case intermittent, and provided that said signs shall not be illuminated after 10 o'clock P.M., unless the premises are open for the conduct of business, and excepting also that gasoline tanks at service stations may carry an illuminated globe at the top, lighted only when business is being carried on.

Section 3: No signboards, billboards, or other advertising devices shall be erected, constructed, maintained or used within the village of Scarsdale, except in conformity with the provisions of the building zone ordinance.

Section 4: No person shall distribute, throw, drop or cause to be distributed, thrown or dropped in or upon any of the highways, sidewalks or public places in the village of Scarsdale any posters, handbills, advertising cards or other similar devices.

Section 5: No person shall wilfully tear down or deface any notice, handbill or ordinance posted in the village of Scarsdale by order of the Board of Trustees or by order of any village officer.

A penalty of $25 is provided for each offense, and a person thus fined shall be guilty of disorderly conduct.

G. HARRIS DANZBERGER.
The Scarsdale Sun.

Speeding Up Financial Statements by Installing Bookkeeping Machines

MIAMI, FLA.—Two objectives prompted the installation of bookkeeping machines in the Finance Department of the city of Miami. The first was to cut down expenses through the reduction of personnel, and the second was to make it possible to produce a financial statement for the City Manager and the Commission at the earliest possible date. Both objectives were satisfactorily realized through the introduction of machines.

Prior to the installation of the machines, the statement for any one month was not ready until the twentieth of the following month. This delay was a source of constant complaint from the City Manager, and justly so. The basis of his complaint was that the operating financial statement, to be of value, should be in his office immediately after the close of the month's business.

The first bookkeeping machine installed was for the purpose of daily control of expenditures. The automatic features of the machine made it possible to consolidate two positions into one, thus effecting a saving in salaries which in a short time paid for the machine. The machine also made it possible to obtain an absolute balance on the last day of the month, and permitted the preparation of the monthly financial statement fifteen days earlier than under the old system. It can now be compiled in just five days. Special forms created for use in our machines make it possible to present the data in the minimum of space, an item of considerable importance in consolidating the total figures.

When a machine was added to the Bureau of Disbursements it again became possible to combine two positions. Once more it was demonstrated that a bookkeeping machine not only could do the work of two people, but could do the same work better.

Since the introduction of bookkeeping machines, clerical help has been reduced 40 per cent, and the overhead or operating expense of the Department has been reduced just the amount of the salaries of those whose services were displaced. The saving of fifteen days' time in preparation means fifteen days extra in which to make changes in appropriations and in expenditures.

So successful has been the system of

"Caterpillar" TRACTORS

•PUSH

•PULL

•LIFT

•DRIVE

Built in seven sizes—a size for every use and a hundred uses for every size.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)

Prices — f. o. b. Peoria, Illinois

FIFTEEN	$1100	THIRTY-FIVE	$2400
TWENTY	$1450	FIFTY	$3675
TWENTY-FIVE	$1900	SIXTY-FIVE	$4350
DIESEL	$6500		

During June we hope you will remember to mention THE AMERICAN CITY

accounting worked out for the city of Miami that a number of other municipalities throughout the state have sent representatives to study it. In one instance an employee of the Miami Finance Department was lent to a sister city for a time in order that the identical system in use in Miami might be installed in the Finance Department.

WILLIAM TRACY,
Chief Accountant.

Recent City Manager Appointments

H. H. ESSELSTYN, of Detroit, has been appointed City Manager of San Diego, Calif. He was formerly Commissioner of Street Railways and Commissioner of Public Works in Detroit; also, during the war, Resident Engineer at the Hog Island Shipyard.

R. M. Abernathy was appointed City Manager of Decatur, Ga., on April 1, to succeed W. H. Weaver, who had been Acting Manager for a short time.

D. M. Allen was appointed City Manager of Fort Fairfield, Maine, on April 18, when Mr. Farnsworth became the Manager of Brewer, Maine.

Fred M. Boone was appointed City Manager of Sapulpa, Okla., on May 2. F. C. Higginbotham had served that city since February, 1929.

Ralph M. Bryant, Assistant Engineer of the Western Division of the Southern Pacific Co., San Francisco, was appointed City Manager of Alameda, Calif., on May 1. For two years following the San Francisco earthquake in 1906, Mr. Bryant was City Engineer of that city. Mr. Bryant succeeded Neil B. Pierson, who had served as City Manager for a year.

Lt. Col. E. S. Dobbin was appointed City Manager of Long Beach, Calif., on April 19, to replace C. C. Lewis, who resigned because of illness. Col. Dobbin was Assistant City Manager beginning June, 1931, and had been Acting City Manager since the first of this year.

J. K. Huey has been appointed City Manager of Fort Lauderdale, Fla., to succeed A. J. Merrill.

Peter A. Kammeraad was appointed City Manager of Grand Haven, Mich., on April 2. For two years he was an engineer for the city of South Pasadena, Calif.; and for several years past he was an Assistant County Surveyor in Michigan.

George H. McVannel, who was appointed City Manager of Flint, Mich., on April 19, is a graduate of the Michigan Agricultural College. For nine years he was County Engineer of Genesee County, Mich.

William B. Schmuhl was recently appointed City Manager of Pontiac, Mich., to succeed William H. Hartley, who was appointed on April 19.

Bernard J. Smith, a graduate in engineering from the University of Liverpool, was appointed City Manager of Goose Creek, Texas, on May 16, to succeed R. M. Manley.

C. L. Stine, City Engineer of Pampa, Texas, for the past two years, recently succeeded F. M. Gwin as City Manager.

Lloyd Waterstrout, appointed City Manager of Sturgis, Mich., on May 10, succeeds Richard Biehl, who had served that city since June, 1929. Mr. Waterstrout was City Manager of Sturgis in 1927.

CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

Investment Bankers Suggest Reconstruction Program for Municipal Finance

By HENRY HART

Executive Vice-President, First Detroit Company, Inc.

EMBARRASSED municipalities are not helpless; their problems are not insuperable. Experience has repeatedly demonstrated the efficacy of a few general principles of financial administration in times of economic instability. These principles, of course, apply only to specific situations; they are not designed to resolve all problems in public finance. For purposes of convenience, a few of the more important principles are sketched in outline, as follows, and the extent to which these principles are adopted will be determined by individual community needs:

THE AMERICAN CITY, in common with the magazines of some of the state leagues of municipalities, has received from the Investment Bankers Association of America, an article by the chairman of its Municipal Securities Committee, offering advice from the bankers' point of view to municipalities which are now facing financial difficulties. Following Mr. Hart's outline of principles, which we are glad to publish, our readers will find a brief comment written especially for this magazine by the Executive Director of the International City Managers' Association.

A. Planning the City's Financial Operations

1. An effective budget.

(a) Prepare a carefully planned, comprehensive, and understandable estimate of all city expenditures and revenues.

(b) After provision for fixed charges and existing deficits, allot the balance of the budget to operating charges based on present ability to pay and not on public demands made during more prosperous times.

(c) Provide a reserve for emergencies, unforeseen expenditures and delinquent taxes. Use the collection experience of the previous fiscal year, viewed in the light of existing business conditions, to determine the size of the delinquent tax reserve.

(d) Balance estimated cash expenditures with estimated cash receipts and avoid the use of delinquent taxes or other paper surpluses to support public expenditures.

B. Controlling the City's Expenditures

1. Keeping expenditure within income.

(a) Allocate appropriations for each department on a monthly basis according to seasonal and special requirements.

(b) Centralize control of expenditures and charge this centralized authority with the duty of maintaining expenditures within the allotment during each monthly interval.

(c) Compare actual cash revenues with budget estimates periodically (monthly or quarterly). When actual cash receipts fall below the estimates (after allowing for the delinquent tax reserve), reduce operating expenditures for the next period in conformity with the lower income, and re-allot appropriations, except fixed charges.

(d) Restrict loans in anticipation of revenues (where tax-collecting periods do not correspond with the fiscal year and when consistent with sound financial practice) to amounts which can be repaid within the fiscal year in accordance with a conservative estimate of probable receipts.

(e) From the first taxes collected, allocate an amount to interest and sinking-fund sufficient to take care of maturities and interest well in advance of requirements.

C. Insuring Adequate Income

1. Encourage and facilitate the collection of taxes when due.

(a) Permit payment of taxes by instalments (preferably quarterly).

(b) Mail bills to all taxpayers before the due date. Indicate the penalties and interest and the dates when they are imposed.

(c) Mail second notice just prior to penalty date.

(d) Advertise and give other publicity to tax due dates, including the time when penalties become effective.

2. Discourage delinquency and insure ultimate payment.

(a) Provide substantial penalties, increased in proportion to the period of delinquency. Do not waive penalties under any circumstances.

(b) Remind delinquents of their indebtedness and allow instalment or partial payments with customary penalties on unpaid balances.

(c) Hold tax sales promptly and encourage tax title buyers by guaranteeing an adequate return on their investment and assuring a good title to properties purchased by them.

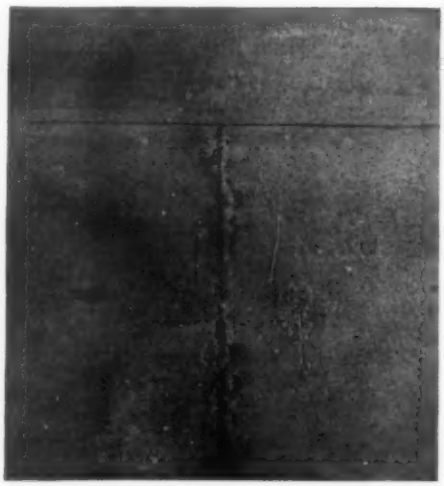
(d) Enforce payment of personal taxes through seizure of personal property within legal limitations. Give publicity to the delinquent list and watch for opportunities to deduct unpaid taxes from money due taxpayers for services rendered or goods purchased by the municipality.

3. Secure all public deposits by adequate surety bond or an amount of readily marketable securities that provides ample margin for depreciation.

4. Maintain revenues of publicly owned utilities at highest point commensurate with service rendered and ability to pay.

Benson Street, Reading, Ohio. Paved with concrete in 1923.

This 9-year test proves the merit of



Unretouched photograph showing section of above pavement around expansion joint after 9 years service.

Carey Elastite EXPANSION JOINT

When this concrete pavement was laid in 1923, it was protected against expansion and contraction stresses by Carey Elastite Expansion Joint. Being a connecting link between two important highways, as well as the main village street, it is subjected to unusually heavy traffic.

The unretouched photograph at the left, taken in March, 1932, and showing a typical pavement section surrounding one of the expansion joints, is eloquent testimony to the durability of both concrete paving and Carey Expansion Joint.

Made with felt side walls which insure *uniform* resistance, Carey Elastite Expansion Joint has for 20 years proved its value and dependability in "making good paving better."

THE PHILIP CAREY COMPANY :: Lockland, Cincinnati, Ohio

Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
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ROOF PAINTS

Carey PRODUCTS

HEAT INSULATIONS
ASBESTOS MATERIALS
CORRUGATED ASBESTOS SIDING
ASFALTSLATE SHINGLES
ROLL ROOFINGS

640

(a) Obtain net earnings from each utility in an amount sufficient to carry its own debt charges.

D. Reducing Fixed Charges and Preserving Credit

1. Discontinue all public improvement programs to be financed by bond issues (except in cases of extreme emergency), when the debt burden is substantial, tax delinquency is increasing and the bond market is unfavorable.

2. Halt special assessment improvements unless their costs are paid in advance by the benefited property owners.

3. When outstanding special assessment bonds are general obligations of the municipality, provide a general tax levy sufficient to offset the losses resulting from anticipated delinquency in special assessment obligations, and, thereby, assure funds to meet maturing obligations.

4. Absorb existing deficits with the tax levy for the following year and do not fund deficits into long-term bonds.

5. If sufficient funds are not available to meet maturing obligations, arrange for refunding well in advance of requirements and in preference to all other financing.

6. Maintain adequate sinking-funds calculated on an actuarial basis.

(a) Restrict sinking-fund investments to the identical bonds for which the fund was created, or to United States Government, state and municipal securities of the highest grade, providing they mature at or prior to the time the sinking-fund is required.

(b) In order to meet bonds maturing within the current year, maintain the liquidity of the sinking-fund by early sale of sufficient assets, if this becomes necessary.

7. Remit principal and interest to the paying agent in ample time and in funds acceptable at par to insure prompt payment on maturity date.

Cooperation Urged

Although this brief of sound financial principles is offered as an aid in the solution for specific emergency situations, many of these principles have a place in the regular administration of public finances. Every municipality follows a few of these principles, and some communities have adopted most of them.

Public officials struggling to surmount the difficulties arising out of trade stagnation and business depression, citizens casting about for a means of reducing the tax burden, bondholders desiring to assist their debtors—all are working toward a common end. Their mutual cooperation in a program based upon sound principles will relieve the pinch of emergency, and open the way to better times.

Bankers' Viewpoint vs. Public Needs

Comments by Clarence E. Ridley, Executive Director, International City Managers' Association

THE article by Henry Hart entitled "A Reconstruction Program for Municipal Finance" discloses that the viewpoint of the investment banker differs greatly in many respects from the attitude of welfare officials and those persons interested in the construction of public improvements. The investment banker wants to guarantee the payment of present and future debt obligations. The welfare workers, with an eye turned solely to humanitarian considerations, desire to satisfy human wants with the first funds available. Public works officials (and promoters) contend that this is the time to promote construction because of two factors—low costs, and the need for employment of capital and labor.

Unless one notes carefully that Mr. Hart says these principles "apply only to specific situations," and that they are offered "for specific emergency situations," the remedies may seem harsh and ill-advised. Even then one may question the advisability of setting aside the first taxes collected solely for debt service charges in a community where there is hunger and suffering among the people. The recommendation that all public improvement programs to be financed by bonds be discontinued is perhaps too broad and should be applied only where (1) the improvements are not justified, (2) the city's debt thus augmented would be a menace to its financial stability, (3) the city is already in financial difficulties, or (4) interest costs are so high that some postponement is advisable.

Justification for Mr. Hart's recommendations centers around this question: "Is it to a city's interest over a long period of time to preserve its credit at any cost?" Failure of a comparatively few cities to meet their obligations have embarrassed all municipalities in their borrowing, thus preventing the construction of public works and the relief of the needy. These municipalities should right their finances at once along the line Mr. Hart suggests, and in a manner commensurate with the needs of the times.

The recommendations are fundamentally sound. They may be considered harsh and one-sided, but if credit is needed they must be adhered to. If they are followed, however, is it not just as reasonable for a city to expect a guarantee of credit at a reasonable rate when it has met the conditions, as it is for the investment banker to want all the guarantees and promise nothing?

The present situation shows that some method of discrimination between good and bad municipal bonds is needed; that stricter debt laws are wanted for the protection of future credit; that credit should be extended where justified; and that principles such as Mr. Hart advocates should be followed in return for the extension of such credit.

The Municipal Bond Market

By SANDERS SHANKS, JR., Editor, *The Bond Buyer*

THE following is a list of recent sales of new issues of state and municipal bonds, showing the net interest rate at which the loans were placed:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$113,000	Winchester, Mass.	4	7½-yr. (avg.)	3.91
10,000,000	Minnesota	4 & 4¼	7 1/3-yr. (avg.)	4.19
5,000,000	Missouri	4½	20½-yr. (avg.)	4.26
3,000,000	California	4½	14-yr. (avg.)	4.30
310,000	New Britain, Conn.	4½	15 5/6-yr. (avg.)	4.34
741,415	Utica, N. Y.	4.40	5 1/6-yr. (avg.)	4.36
12,002,000	Westchester Co., N. Y.	4¼ & 4½	19 1/3-yr. (avg.)	4.37
1,000,000	Jackson Co., Mo.	4½	12 5/6-yr. (avg.)	4.43
250,000	Minneapolis, Minn.	4½	1-5-yr. (ser.)	4.46
2,500,000	Milwaukee Co., Wis.	4½	3-7-yr. (ser.)	4.54
29,000	Rock Hill, Pa., Sch. Dist.	4¾	21 1/6-yr. (avg.)	4.73
150,000	Long Beach, Calif.	5	30 5/6-yr. (avg.)	4.99
5,000,000	New York, N. Y.	5½	2-5-yr. (ser.)	5.50
125,000	Youngstown, Ohio	6.00	5 5/6-yr. (avg.)	6.00
750,000	New Orleans, La.	5	3-yr. (avg.)	6.49

Financial Statistics of Cities: 1930

THE Bureau of the Census has announced its total figures for the finances of the 310 cities of over 30,000 population, for the 1930 fiscal year. Outstanding statistics include:

Governmental cost payments, $3,810,681,763, comprising $2,112,198,973 for operation and maintenance of general departments ($44.53 per capita), $178,109,755 for operation of public service enterprises, $405,152,731 for interest on debt, and $1,115,220,324 for outlays for permanent improvements.

Revenue receipts, $3,418,502,995, the chief items being $2,180,080,442 from general property taxes, $339,007,346 from public service enterprises, $236,594,582 from special assessments, $199,639,642 from subventions, donations and pension assessments, $157,501,868 from interest, rents and highway privileges, and $110,373,147 from licenses. Only seven cities lacked revenues sufficient to meet operating expenses and interest.

Net indebtedness, $6,857,239,759. While this was a 7.2 per cent increase over 1929, for the group, 119 cities showed a decrease.

Assessed valuation of taxable property, $87,234,279,162. The city tax levy was $2,389,319,497, or $50.37 per capita.

See page 114 for diagrams and further data.

"STRAIGHT" THINKING is being done these days

SOME straight thinking is being done these days as big repair bills for short-term pavements 'lock horns' with undernourished budgets.

Why not act now in *your* community to prevent such recurrences in 1937, or 1942 or 1952!

Resurface and rebuild with brick! Protect new pavements with the weather-proof and traffic-proof armor of vitrified brick. Check your records on brick maintenance as against other types—ask neighboring officials their experience. It is lowest by far—but check up anyway!

For information on resurfacing with brick, address the National Paving Brick Association, 1245 National Press Building, Washington, D. C.

BRICK—the Pavement that Lasts

When you write for that catalog, kindly mention THE AMERICAN CITY

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Residence Districts

ILLINOIS.—*Forbes v. Hubbard*, Supreme Court, April 23, 1932.—Application for a permit to construct a business building, in a built-up residential district, on land at the corner of two important state highways. The property on the opposite side of the street, in another municipality, was zoned for business, and so built up. *Held* that, the reasonableness of the action of the City Council in zoning the district as residential being at least fairly debatable, the action will not be disturbed by the Court; in spite of the fact that it is a general rule to fix the dividing line of districts in such a way as to avoid making one side of a main artery of travel purely residential where the opposite side is already so used as business property as to establish its character in that regard.

ILLINOIS.—*Kennedy v. Evanston*, Supreme Court, April 23, 1932.—Bill to declare invalid two amendments to the zoning ordinance of the city, rezoning certain property from an A (single family) to a B (apartment, 21 families per acre) district; dismissed in Superior Court; decree reversed in this Court and remanded to Superior Court for proceedings consistent with this opinion.

No sufficient reason for the reclassification is shown. Since the original ordinance was passed, there have been no changes except those incident to the growth of a rapidly growing city; contiguity to a district with dirt, smoke and noise from apartments is not a sufficient reason, since more desirable districts must adjoin less advantageous ones. There is enough vacant land in apartment districts for many years to come; the fact that a majority of the property owners of the district have petitioned for the change is no sufficient reason for it. The change must be necessary for the public good.

Garage

MARYLAND.—*Mayor and Council of Pocomoke City v. Standard Oil Co. of New Jersey*, Court of Appeals, reported in *Baltimore Daily Record*, May 2, 1932. —An ordinance was passed by the city that no filling station should be erected on Market Street between two named streets; Market Street being the main thoroughfare of the city, where the greater part of the commercial, financial and amusement interests are located. *Held* that the ordinance was valid.

Zoning Setbacks—Corner Lots

MICHIGAN.—*Holden Co. v. Connor*, 241 N. W. 915.—The zoning ordinance of the village of Grosse Pointe provides, with regard to a few corner lots within the local business zone, that: "On a corner lot there shall be a side yard along the side street lot line in all cases where such line is substantially the continuation, without intervening streets, of the street lot line of lots in an adjoining residence district, or of adjoining lots in a local business district on which a front yard is required therein. The width of such side yard shall be not less than 10 feet, except that where the width of a corner lot of record at the time of passage of this ordinance is less than 50 feet, the width of the required side yard on that lot may be reduced to one-fifth of the width of such lot." *Held* that the ordinance is unreasonable, arbitrary, discriminating, not upon a plan fairly designed to accomplish the statutory purposes, and invalid. The question of the constitutionality of the statute is not raised.

Platting

MINNESOTA.—*In re Grisselles*, 241 N. W. 590.—Exclusively agricultural land subdivided into small acreages for rural purposes is "unplatted" land, within a statute authorizing detachment of land from a city.

Private Covenants

NEW JERSEY.—*Schweitzer v. Adami*, 159 Atl. 529.—The private rights of purchasers of lots obtained by virtue of reference to a map describing certain areas as streets and parks terminate when these areas become public streets or parks, and do not revive upon the subsequent vacation of the public right.

Land Under Water—Side Yards

NEW JERSEY.—*Wynn v. City of Margate*, 9 Misc. 1324.—The zoning ordinance provided that in a dwelling zone there should be side yards each of at least three feet, with a total, on both sides of the building, of not less than eleven feet. A portion of the lot was on pilings on land covered by water. *Held* that the ordinance applied to land under water, the alteration of a building so that it was within twelve inches of the side line of the portion of the lot under water being a violation of the ordinance.

Non-Conforming Use

NORTH CAROLINA.—*In re Rose Builders Supply Co.*, 163 S. E. 462.—Whether the placing of goods sold out of a filling station, and a grease dispenser, in a vacant gas station is "starting construction" of a filling station as regards expiration of time limit before a zoning ordinance becomes effective, is a question for the jury.

Boards of Appeal—Setback

OHIO.—*L and M Investment Co. v. Cutler*, 180 N. E. 379.—The setback provision in the zoning ordinance of the city of Cleveland is subject to variance by the Board of Appeals. A board of appeals, with the power of variance in specific cases of practical difficulties or unnecessary hardships, is an administrative body. The creation of such a body with this power is not a delegation of legislative power, contrary to the state constitution, as the board is validly created.

Airports

OREGON.—*Mollencop v. City of Salem*, 8 Pac. 2d, 783. The agreement of the city with the manager of its airport provided that the manager should collect fees and rentals such as were exacted by others in this service, and that the city should have as its own to lease, sell or operate various concessions which might produce revenue for the city. *Held* that this contract showed, prima facie, that the airport was operated by the city in its proprietary capacity as regards liability for injury to invitee.

NOTE BY EDITOR.—With regard to the liability of cities in the operation of a rports, the reader is referred to the *National Municipal Review*, Notes on Judicial Decisions, for May, 1932.

Zoning—Constitutionality

TEXAS.—*Lombardo v. City of Dallas*, 47 S. W. 2d, 495.—The legislative act and the zoning ordinance of the city of Dallas dividing the city into residence, business and industrial districts are valid and constitutional.

Metropolitan Districts

THE final report on "Metropolitan Districts," which has just been published by the Bureau of the Census, contains maps and statistics in detail for each of 96 districts. It shows that these districts comprise in the aggregate 45 per cent of the total population of continental United States; that 60 per cent of the population of the districts reside in the central city or cities, while 40 per cent are residents of the suburbs or of the adjacent or neighboring smaller cities included within the district; and that the population of the suburbs and neighboring cities is increasing much faster than that of the central cities, the percentage of increase being 39.2 per cent for the suburbs as against 19.4 per cent in the central cities.

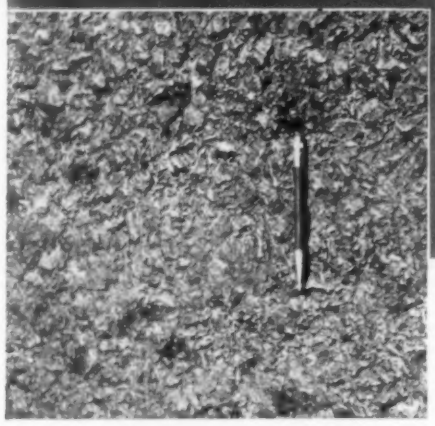
The report is obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 85 cents.

City Planning Conference Postponed

THE National Conference on City Planning, which had been scheduled to meet in Los Angeles this month, has been postponed until the fall. The dates and place of meeting have not yet been announced.

TRAFFIC-SAFETY deserves equal consideration with economy in the selection of road materials. By specifying Tarvia "Re-Tread" you get both

River Road, Floyd County, Indiana. Tarvia "Re-Tread," 1928.



Close view of a Tarvia "Re-Tread" road showing its non-skid character.

essentials . . . plus a lasting, trouble-free road, easily and quickly built. Because of its granular surface, a Tarvia "Re-Tread" road is safe against skidding at any sane speed—regardless of weather. The same surface that provides easy-riding also gives tires a firm tread-hold.

Tarvia "Re-Tread" was developed by Tarvia engineers and field men working in conjunction with highway officials. Their experience is available to you. 'Phone, wire or write our nearest office.

The Barrett Company

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Baltimore	Youngstown	Bethlehem
Rochester	Portland, Me.	

THE BARRETT COMPANY, Ltd.
Montreal Toronto Winnipeg Vancouver

Tarvia "RE-TREAD"

TRADE-MARK REG. U. S. PAT. OFF.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Conveyance of city prisoners in police car being a governmental function, neither city nor driver is liable for the latter's negligence (Iowa Supreme Court: *Lauxman v. Tisher*, 239 N. W. 675).

Annexation

Statute held to permit extension of limits into adjoining county (Springfield Court of Appeals: *Schildnecht v. City of Joplin*, 41 S. W. 2d, 590).

Annexation ordinance held not invalid unless based on proper petition or if including land not described in petition (Pennsylvania Superior Court: *In re Annexation to Borough of Jenkintown*, 23 Pa. Mun. Law Rep. 119).

Appointment Deadlocks

On mayor and council disagreeing on appointee to vacant office, mayor held subject to mandamus to make new nomination (Montana Supreme Court: *State v. Peck*, 4 Pac. 2d, 1086).

Assessments

City tax assessment held not vitiated by insufficient description of property identifiable by reference to other data (Florida Supreme Court: *Trust Company of Florida v. City of Tampa*, 138 So. 73).

Attorney's Compensation

Special allowance to city attorney held an unconstitutional increasing of his compensation (Arizona Supreme Court: *State Consolidated Publishing Co. v. Hill*, 3 Pac. 2d, 525).

Attorney's Opinion

City held not bound by opinion given by city attorney to private party (United States Circuit Court of Appeals, Second Circuit: *City of Sanford, Fla. v. Chase National Bank*, 50 Fed. 2d, 400).

Automobiles Impounded

Ordinance imposing $3 fee against vehicles impounded for violating parking regulation upheld (Louisiana Supreme Court: *Steiner v. City of New Orleans*, 136 So. 596).

Beverage Regulations

Ordinance imposing license tax on manufacturers and bottlers of soft drinks inapplicable to products sold and delivered within city but manufactured elsewhere (Alabama Court of Appeals: *Barrow v. City of Bessemer*, 138 So. 552).

Bond Elections

Bond election not invalidated by failure to preserve ballots as provided by statute (Arizona Supreme Court: *McLoughlin v. City of Prescott*, 6 Pac. 2d, 50).

Broadcasting Contract

Contract by county with broadcasting corporation held unconstitutional as use of public funds for private aid (Alabama Supreme Court: *Stone v. State*, 136 So. 727).

Business Regulations

Ordinance requiring lessors of driverless cars for hire to secure liability for lessees' negligent operation held constitutional (United States Supreme Court: *Hodge Drive-It-Yourself Co. v. City of Cincinnati*, 52 Sup. Ct. 144).

Ordinance requiring barber shops to remain closed between 6:30 P.M. and 7:30 A.M. held void as being unreasonable (Mississippi Supreme Court: *Knight v. Johns*, 137 So. 509).

Civil Service

Reinstated patrolman entitled to wages during period of suspension (Pennsylvania Superior Court: *Bolay v. City of Philadelphia*, 157 Atl. 374).

Depository Bonds

City's compromise of claim against surety on bank depository bond upheld in suit by taxpayer (United States Circuit Court of Appeals, Eighth Circuit: *Carney v. City of Grinnell*, 53 Fed. 2d, 44).

Disciplining Firemen

Fireman held subject to discipline under ordinance for intoxication while off duty (New Jersey Supreme Court: *Mee v. Town of Montclair*, 157 Atl. 447).

Election Notices

Irregularity in bond election notice not fatal unless affecting free expression of electoral will (Arizona Supreme Court: *McLoughlin v. City of Prescott*, 6 Pac. 2d, 50).

Fixing Salaries

Town salaries required to be specifically authorized by statute or vote, but sufficiently authorized by vote to "pay same as last year" (Maine Supreme Judicial Court: *Milliken v. Gilpatrick*, 157 Atl. 714).

Fraudulent Judgments

Persons conspiring with officials to secure fraudulent judgment against city held jointly liable with such officials to municipality and innocent persons (Oklahoma Supreme Court: *State v. Kimbrell*, 5 Pac. 2d, 366).

Funding Debts

Floating indebtedness properly funded, although taxes were improperly applied and ordinance failed to show validity of debt (Kentucky Court of Appeals: *Pace v. City of Paducah*, 44 S. W. 2d, 574).

Gas Franchises

Award of gas franchise under competition properly conditioned that successful bidder own minimum quantity of flowing gas (United States Circuit Court of Appeals, Sixth Circuit: *Petroleum Exploration v. Joseph Greenspon's Sons Iron & Steel Co.*, 52 Fed. 2d, 944).

Irregular Purchases

City commissioner's irregular purchase of fire hose ratified through city's accepting and using hose (Arkansas Supreme Court: *City of Fort Smith v. United States Rubber Co.*, 42 S. W. 2d, 1004).

Motor-Bus Fares

Street-railway company substituting busses entitled to charge 10-cent fare-trolleys having been operated at a loss under a 7-cent fare (New Jersey Supreme Court: *Borough of Bradley Beach v. Board of Public Utility Commissioners*, 157 Atl. 451).

Newspapers

Statute requiring official publications in a newspaper of "general circulation" held not to require a paid circulation (Ohio Court of Appeals: *Ambos v. Campbell*, 178 N. E. 320).

Official Eligibility

Under constitutional provision against double office holding, county commissioner held to have vacated office on accepting commission as notary public (North Carolina Supreme Court: *Harris v. Watson*, 161 S. E. 215).

Official Notices

Statutory requirement, requiring publication of advertisement "for a period not less than thirty days," substantially complied with by publication in four nonconsecutive issues of a weekly newspaper (United States Circuit Court of Appeals, Sixth Circuit: *City of Corbin v. Joseph Greenspon's Sons Iron & Steel Co.*, 52 Fed. 2d, 939).

Official Tenure

Councilman entitled to retain office until qualification of successor, despite his illegal re-election (Georgia Supreme Court: *Minter v. Lane*, 161 S. E. 580).

Paving Assessments

Railroad precluded to deny benefit from paving improvement, having failed to protest assessment (Tennessee Supreme Court: *Johnson City v. Carolina, Clinchfield & Ohio Railway Co.*, 43 S. W. 2d, 215).

Paving Contracts

Surety on paving contractor's bond not entitled to rescind settlement with city on ground of fraud (United States Circuit Court of Appeals, Sixth Circuit: *City of Richmond v. Fidelity & Deposit Co.*, 53 Fed. 2d, 437).

Tax Collection

Constitutional provision for collection of state taxes held to apply to municipal taxes (Louisiana Court of Appeal: *McCall v. Blouin*, 138 So. 528).

Traffic Regulations

City entitled to regulate private driveways used by public (Idaho Supreme Court: *Crossler v. Safeway Stores*, 6 Pac. 2d, 151).

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Jails

Plans for City Police Jails and Village Lockups.—By Hastings H. Hart, Consultant in Delinquency and Penology, Russell Sage Foundation, New York. 1932. 27 *quarto pp.* $1.50 *from* THE AMERICAN CITY.

Dr. Hart, well-known penologist, died a few days before this volume was presented to the public. It is the culmination of half a century's study of prison conditions. The book was written because a study of police jails and village lockups made by Dr. Hart in 1931—the first comprehensive study of its kind—revealed that the 11,000 prisons of these types in this country outnumbered all others by about 3 to 1. The majority of them, he found, "are literally a public nuisance and are unfit for the purpose for which they are designed." Most of them are insanitary and poorly equipped, they are firetraps, and they are entirely inadequately planned for either efficiency or the application of modern principles of classification and segregation. Dr. Hart offers suggestive plans, based on the experience of progressive communities, for police stations in a metropolitan city, a medium-sized city and a small city, and for a fireproof lockup in a small village.

Public Works

The latest manual to be issued by the Committee on Uniform Street Sanitation Records of the International Association of Public Works Officials is "Manual of Public Works Records and Accounting for Cities of 10,000 to 40,000 Population, as installed in Winona, Minnesota." The manual is published jointly by the Committee and the League of Minnesota Municipalities. It explains how public works labor, materials and supplies, and equipment can be managed and controlled most effectively, and outlines a complete work program, a budget system and the means by which the general city accounts may exercise continuous financial control. 81 pp., mimeographed, including a number of forms. $1.00. (Apply to the Committee, 923 E. 60th St., Chicago, Ill.)

Golf Courses

The 1932 directory of "Municipal Golf Courses in the United States, with Statistical Information," issued by the Public Links Section of the United States Golf Association, gives the size, playing distance, par, fees, hours and other pertinent data for all the known municipal courses in this country. 35 pp. (Apply to the Association, 110 E. 42d St., New York.)

Billboards

In its preparation of a concrete model program for roadside beautification, the National Council for Protection of Roadside Beauty has announced in the current number of The Roadside Bulletin (Vol. 2, No. 2) 33 specific suggestions for rural billboard legislation, as a check-list of the principal items which it considers desirable to have included in such legislation. The program is based upon surveys of actual conditions. It incorporates the best features of existing legislation and adds other recommendations. (Apply to the Council, 119 E. 19th St., New York.)

Motor Vehicles

A 6-page folder on "The Cardinal Rules of Good Driving" has been prepared by Robbins B. Stoeckel, Commissioner of Motor Vehicles of Connecticut. Five specific rules for highway traffic and three for street traffic are given and the reasons for them discussed. (Apply to the Commissioner, Hartford, Conn.)

Population Distribution

The Regional Plan Association, Inc., of New York, presents outstanding facts and conclusions regarding "Present Distribution and Future Growth of Population in the New York Region" in Information Bulletin No. 7. The bulletin consists of comparative maps for 1920 and 1930, diagrams and tables, and an explanatory text. 16 pp. (Apply to the Asociation, 400 Madison Ave., New York.)

Taxicabs

A Nationwide Survey of Taxicab Regulation.—Bulletin No. 389 *of American Electric Railway Association, New York. April* 1, 1932. 293 *pp., mimeographed.* $5.00 *from* THE AMERICAN CITY.

Having become practically free from the "jitney" menace, the street railways and bus lines in many cities are now facing another problem in the cut-rate, unregulated taxicab, which has become more bothersome as street-car fares have increased. There are broad public aspects to the situation, aside from danger to the established mass-transportation agencies, in regard to such matters as financial irresponsibility of cab owners or drivers and unjustified increase in traffic congestion. The American Electric Railway Association has therefore performed a service of much public interest in bringing out this study, which has special reference to the history and status of taxicab regulation in 14 states, the District of Columbia and New York City, and which places emphasis on the growing attitude that the taxicab business should be regulated as a public utility.

Maps

The 1932 editions of the New Jersey and of the Minnesota official state road maps are available. Each consists of a large-size map which folds into pocket size, and contains on the back a highway mileage chart showing the distances between the principal cities and towns, as well as other information for travelers. (Apply to the New Jersey State Highway Commission, Trenton, N. J., and the Minnesota Dept. of Highways, 1246 University Ave., St. Paul, Minn.)

Tax Charts

The third edition of "Federal and State Tax Systems," comprising tax charts for many jurisdictions, has been prepared by the Tax Research Foundation, under the direction of the New York State Tax Commission. It is published by Commerce Clearing House, Inc., Loose Leaf Service Division of the Corporation Trust Co., Chicago. It contains 145 pages of charts and tables, 11½ x 15 inches, presenting the essentials of the taxing systems of the United States, the 48 states and the District of Columbia, and 23 foreign countries or subdivisions; there are also many general and special tables on the "Status of Certain Tax Matters in the Various States," such as tax commissions, property taxes, motor-vehicle and gasoline taxes, poll taxes, sales taxes, and taxes on public utilities, banks, chain stores, forest lands, incomes, inheritances, tobacco, etc $10; $1 discount for payment with order. (Apply to Commerce Clearing House, Inc., 205 W. Monroe St., Chicago, Ill.)

Better Homes

Recent publications of Better Homes in America include a revised edition of "Your Better Homes Campaign," a 24-page pamphlet (5c); and two reprints, "Prize-Winning Small Houses—1931 'Better Homes in America' Architectural Competition," by James Ford, Executive Director, from *The Architectural Record* for April (22 pp.), and "Better Homes Small House Architectural Competition for 1931," by Katherine F. Liston, from the *American Building Association News* for April, each 10c. (Apply to Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C.)

Noise Ordinance

A new "Standard Noise Ordinance for New York City" has been drawn up by the Noise Abatement Commission of New York, which has just completed several years' work of investigating and classifying the city's sounds. The ordinance contains eighteen clauses making illegal all types of noise heard in the city. It also contains provisions forbidding many noises against which there is no redress at the present time, and incorporates and brings up-to-date noise statutes now on the books. 8 pp., mimeographed. (Apply to the Health Commissioner of New York, 139 Centre St., New York.)

Housing

Home Finance and Taxation.—Reports of the Committee on Finance and Taxation. The President's Conference on Home Building and Home Ownership, Washington, D. C. 1932. 278 *pp.* $1.15.

Slums, Large-Scale Housing and Decentralization.—Reports of the Committees on Blighted Areas and Slums, Large-Scale Operations, Business and Housing, and Industrial Decentralization and Housing. The President's Conference on Home Building and Home Ownership, Washington, D. C. 1932. 245 *pp.* $1.15.

These are volumes II and III of the President's Conference on Home Building and Home Ownership, which met in Washington in December. (Volume I was reviewed in the May issue of THE AMERICAN CITY.) In addition to the committee reports, which were distributed at the Conference in pamphlet form, the books contain numerous summaries and appendices. These include, for Volume II, Home Financing in West Coast Cities; Summary of Data from Lending Agencies; Special Types of Second Mortgage Companies; Foreclosure Laws; Mortgage Foreclosure and Loan Costs; Text of President Hoover's Statement on the Proposed Establishment of Home Loan Discount Banks; The General Property Tax as a Real Estate Tax; The Shifting and Incidence of Real Estate Taxes; Increasing Tax Delinquency; Assessments of Property in Washington, D. C.; The Effect of a Property Tax Offset under an Income Tax; Taxation of Land Values in Canada; Governmental Organization and Public Expenditures; and Relation of Government Organization and Public Expenditures to Taxation of Homes.

Appendices for Volume III include Some Legal Aspects of the Slum Problem; Better Housing Through Rational Taxation; Social Service for the Slum; Slum Clearance and Rebuilding; The Inhabited Alleys of Washington; A Practical Plan for Slum Clearance; A Financing Plan for Reconditioning; Experience with Large-Scale Operations; Principles Recommended for Acquiring Property by Eminent Domain; A Statement on the Proposed Mortgage Discount Bank; The Proposed Temporary Illinois State Housing Commission; The Experience of the Amalgamated Projects of the New York State Housing Board; Housing Problems of Salaried Workers; Economic Factors Underlying Housing, and Experience of Limited Dividend Companies; Plan for Better Organization of the Housing Industry; Population Trends Toward Concentration and Decentralization; Location Tendencies of Industry in Selected Areas.

Wayside Stands

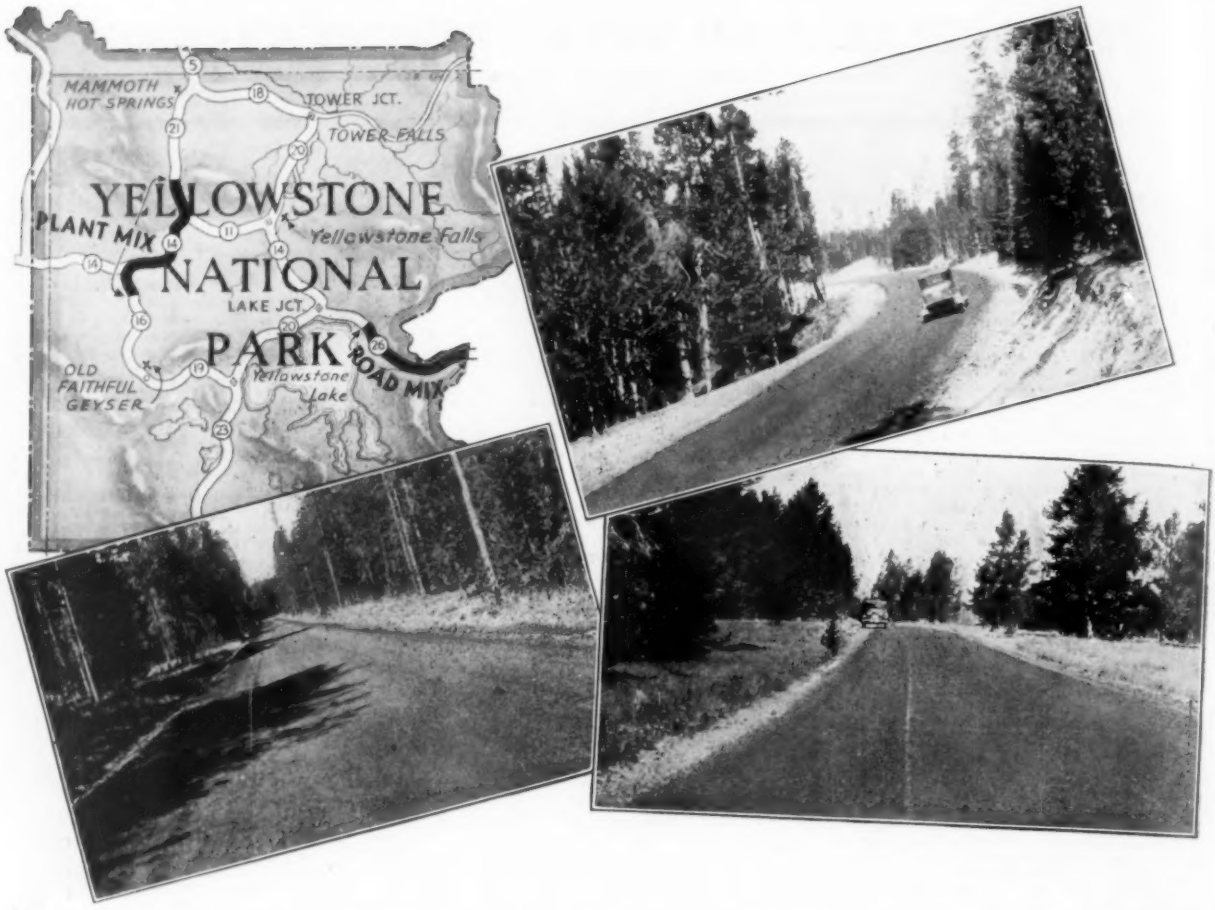
A 4-page illustrated bulletin of the Massachusetts Forestry Association (No. 153) is devoted to a discussion of "The Wayside Trading Post," by Harris A. Reynolds, Secretary of the Association. The advantages of attractive planted posts or stands are pointed out, and the Association appeals to all property owners along the highways to cooperate in the efforts to beautify the roadsides. 3c. (Apply to the Association, 4 Joy St., Boston, Mass.)

Taxation

"Taxation, as Related to Architecture and the Practice of the Profession" is the title of the report of a special committee of the American Institute of Architects, presented to the Institute's convention in April. Various aspects of the subject are discussed, conclusions are drawn and recommendations offered. 20 pp. (Apply to W. R. B. Willcox, Chairman of the Special Committee of the Institute, 1272 Kincaid St., Eugene, Ore.)

Bridges

A brochure entitled "Bridges Lasting and Beautiful" is made up of attractive photographs of a number of bridges of different types designed by Robinson & Steinman, Engineers. 32 pp. (Apply to Robinson & Steinman, 117 Liberty St., New York.)



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ASPHALTS FOR EVERY PURPOSE

Metropolitan Districts

The United States Bureau of the Census has issued its report on "Metropolitan Districts—Population and Area," based on the 1930 census. Data on 96 districts are given. See page 93 of this issue. 253 pp. (large). 85c, paper. (Apply to Superintendent of Documents, Washington, D. C.)

Athletics

Among the available transcripts of the weekly Wingate Athletic Broadcasts, arranged by the Wingate Memorial Foundation and given over the Columbia network on Saturday mornings, are talks on "Football Fundamentals," by T. A. D. Jones, and "Touch Football," by Jacob Silbert (No. 2), and "Character-Training Values in Football and Other Body-Contact Games," by Dr. E. Leory Mercert, and "Speedball," by Elmer D. Mitchell (No. 3). 15c each. (Apply to the Foundation, 57 E. 56th St., New York.)

Child Welfare

In answer to the question, "How is the depression affecting the welfare of the children and youth of the nation?", Dr. James Mickel Williams, Professor of Sociology at Hobart College, has prepared a pamphlet on "Children and the Depression," based on facts observed and checked by the author. Nine recommendations are made as to "what should be done about it." 19 pp. (Apply to the American Association of Public Welfare Officials, Washington, D. C.)

Comfort Stations

The Women's City Club of New York, assisted by a grant from the Milbank Memorial Fund, has just concluded a study of public comfort station facilities in New York City. A preliminary brief summarizing the findings and recommendations has been issued in a 6-page folder entitled "Comfort Stations in New York Today and Tomorrow." (Apply to the Club, 22 Park Ave., New York.)

Swimming Pools

The latest issue of the *Journal of the American Association for Hygiene and Baths*, which appears once or twice a year, is dated April, 1932, and contains the papers presented at the Association's 1931 annual convention, held in Detroit last November. These discuss various types of pools and pool problems. Several state health laws relating to pools are given. 34 pp. 50c. (Apply to the *Journal*, P. O. Box 307, Gary, Ind.)

Blighted Areas

The Committee on Blighted Area Housing of the Architects Club of Chicago has prepared a report entitled "Rehabilitating Blighted Areas." Various phases of the problem of blighted areas are discussed and a plan for their rehabilitation is offered. Also included are a bibliography, an ownership and management plan and a typical block development plan. 60 pp. 25c. (Apply to the Club, 1801 Prairie Ave., Chicago, Ill.)

Unemployment Relief

The "Proceedings of the Minnesota Conference on Unemployment Relief and Stabilization," edited by Russell A. Stevenson, Director of the University of Minnesota Employment Stabilization Research Institute, contains five sections: I, Administrative Problems of Unemployment Relief; II, Public Employment Exchanges; III, Stabilization and Unemployment Reserves; IV, Individual Plant Management: Its Relation to the Causes and Problems of Industrial Readjustments; and V, Individual Plant Management and Industrial Readjustments. Twenty-five papers are reprinted. 95 pp. $1.00. (Apply to the University of Minnesota Press, Mineapolis, Minn.)

City Planning

"Boys and Girls to Show What Town Planning Should Be," is the subject of an illustrated article by Bernard Peterson, printed on a single large sheet of paper. Mr. Peterson describes the contest in which children are invited to submit their own plans for the future of their towns. The contest is sponsored and awards are offered by the Town Planning Committee of the George Washington Bicentennial Commission. 1 copy postpaid, 5c; 25 copies, C.O.D., 75c. (Copies of an article on the "Game Plan" can be obtained for the same price.) (Apply to the Secretary of the Committee, Room 1019, 50 Congress St., Boston, Mass.)

Recreation

The May issue of *Recreation*, the publication of the National Recreation Association, is the Year Book Number. Playground and community recreation statistics for 1,010 cities in the United States and Canada are included. An analysis has been made of the activities in recreation programs reported, and the service of the National Recreation Association in 1931 is outlined. 72 pp. 50c. (Apply to the Association, 315 Fourth Ave., New York.)

Flammable Liquids

The League of Kansas Municipalities has published a 38-page bulletin (No. 95), dated March 1, 1932, entitled "The Storage and Handling of Inflammable Liquids in Cities." It includes general descriptive and explanatory matter, two suggested ordinances, and information regarding statutes, court decisions, and fire marshal's regulations relating to the subject. $1.00. (Apply to the League, Lawrence, Kansas.)

Traffic

"Modern Practice in Design and Use of Safety Zones," by Hawley S. Simpson, Research Engineer, American Electric Railway Association, is the title of a 23-page pamphlet consisting of reprints of three illustrated articles which appeared in recent issues of AERA, publication of the Association. Mr. Simpson reports the results of a comprehensive study of the improvement which is being made in safety zone design. (Apply to the Association, 292 Madison Ave., New York.)

Public Buildings

As a guide to building committees or other municipal officials, a booklet entitled "The Systematic Steps in the Planning and Construction of Public Buildings—Functions of Committees, Architects and Engineers and Intelligent Appropriations for Construction," has been prepared by the organization of Fay, Spofford and Thorndike, engineers, and Ralph Temple Jackson, architect. Ten steps are taken up, under two headings: Preliminary Work Previous to the Appropriation for Building Construction; and Final Work After Presentation of Investigation Committee's Report. 15 pp., mimeographed. A limited number of copies is available for free distribution. (Apply to Fay, Spofford & Thorndike, 44 School St., Boston, Mass.)

Taxation

"The Other Side of the Tax Problem," the searching and refreshing analysis of the current assault on taxes and governmental expenditures, by William Anderson, Professor of Political Science in the University of Minnesota, which appeared in the January *Minnesota Municipalities* and afterwards in other state municipal magazines, is now available as a reprint. 5 pp. "Observations upon the Minnesota Tax System," by Professor Simeon E. Leland of the University of Chicago, is also reprinted from the same magazine. 7 pp. (Apply to League of Minnesota Municipalities, 16 University Library, Minneapolis, Minn.)

Health and Welfare

The five-city area of Cleveland, Lakewood, Cleveland Heights, East Cleveland, and Shaker Heights, Ohio, includes 252 census tracts, which for purposes of analysis have been combined to form 14 economic areas based on ability to purchase housing facilities as indicated by values of homes owned and by monthly rentals, substantiated by the possession of radios and telephones. Conditions in these economic areas have been analyzed by Howard Whipple Green, Director, Statistics and Research, Cleveland Health Council, in the following mimeographed pamphlets: "Tuberculosis and Economic Strata—Cleveland's Five City Area, 1928-1931," 15 pp., 50c; "Infant Mortality and Economic Status," 9 pp., 25c; and "Unemployment and Economic Status," 12 pp., 50c. Maps, curves, tables, and comment present the analysis of the data. It was determined that the tuberculosis death rate for the colored population in each economic area was five times the white rate. Cleveland's infant mortality rate for 1931 was the lowest in any of the ten largest cities in the United States; the rate is much higher in the low economic areas than in the high economic areas; there is a similar condition regarding unemployment—much in the lower economic areas, little in the higher economic areas. (Apply to the Council, 715 Superior Ave., N. E. Cleveland, Ohio.)

Municipal Documents

A check-list of current municipal documents for all the large cities in this country and three of the largest cities in Canada is now available for the first time. A special committee of the Special Libraries Association has compiled a "Basic List of Current Municipal Documents," which includes all regularly published reports issued periodically since 1927 by the larger cities of America. Documents are listed by subjects and alphabetically by cities. 71 pp. $1.00. (Apply to the Association, 345 Hudson St., New York.)

Government

Two articles by Murray Seasongood, President of the National Municipal League and former Mayor of Cincinnati, on "How Political Gangs Work" and "Some Recent Trends in Municipal Government," have been reprinted from *The Harvard Graduates' Magazine* by the National Municipal League in the form of a 31-page pamphlet. (Apply to the League, 309 E. 34th St., New York.)

City Planning

"City Planning as a Professional Career," an article by Professor Henry V. Hubbard, Chairman of the Harvard University School of City Planning, and Assistant Professor Howard K. Menhinick, has been reprinted from the January issue of *City Planning*. The work of city planners, desirable personal qualifications, preparation, opportunities and rewards are discussed. 9 pp. (Apply to the Harvard School of City Planning, Cambridge, Mass.)

Sanitary Districts

The "Eighth Annual Report (1931-1932) of the Illinois Association of Sanitary Districts" contains the minutes of the annual meeting held in Peoria last June, including a number of papers on various aspects of sewage treatment in Illinois. 71 pp. (Apply to the Association, Urbana-Champaign, Ill.)

Transportation

"An Analysis of the Transportation Problems of the City of St. Louis" has been prepared by Arthur C. Meyers, Secretary of the Transportation Survey Commission. It takes up the physical, financial and legal aspects of the local transportation needs. Several appendices on related subjects are included. 38 quarto pp. (Apply to Mr. Meyers, Transportation Survey Commission, St. Louis, Mo.)

Other Reports Received

BALTIMORE, MD.—Facts and Figures and VIIIth Quadrennial Message to Baltimore City Council, with Reports from all City Agencies, covering 1927-1931 period. 315 pp., plus maps and diagrams.

BALTIMORE, MD.—Year Book, Classified Municipal Employees Association, 1932. 114 pp.

DES MOINES, IOWA.—Annual Report, Board of Adjustment, 1931-1932. 13 pp., mimeographed.

DES MOINES, IOWA.—Annual Report, City Plan and Zoning Commission, 1931-1932. 17 pp., mimeographed.

FREDERICKSBURG, VA.—Annual Report, 1931. 66 pp.

IOWA.—Report on Municipal Finances for the year ending March 31, 1931. 252 pp.

KNOXVILLE, TENN.—Report of the Bureau of Health, Department of Public Welfare, 1931. 67 pp., mimeographed.

LITCHFIELD, MINN.—Annual Statement of Light, Power, Heating and Water Plant, year ending April 4, 1932. 6 pp.

LYNCHBURG, VA.—Annual Report, 1931. 128 pp.

MINNEAPOLIS, MINN.—Budget Facts and Financial Statistics for 1932, Issued by the Board of Estimate and Taxation. 55 pp.

ST. PAUL, MINN.—Summary of Annual Report of the Civil Service Bureau, 1931. 38 pp.

TRENTON, N. J.—Annual Report, Bureau of Health, 1931. 64 pp.

WALLINGFORD, CONN.—Report of the Wallingford Electric Works, year ending July 31, 1931. 80 pp.

WEBSTER COUNTY, IOWA.—Financial Report, 1931. 57 pp.

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Washington St., Albany, Ga.—Originally paved with brick in 1905, repaved in 1931.

WHEN officials of Albany, Ga., decided to resurface the main street of their city, paved with brick in 1905, they considered various materials and costs carefully. The decision was to take up the old brick, remove abandoned street car tracks, repair the base where necessary, and relay the same brick after turning them on the side. ◪ The total cost of resurfacing this pavement, 56 feet wide and 1800 feet in length, was approximately 50c a yard! 34c of this amount went for labor. ◪ Today the brick which have served under heavy traffic for more than 25 years, form a smooth, safe pavement which is good for at least another quarter century of service. ◪ Here is an example of true paving economy. And here is an example of the unfairness of judging paving costs on the basis of original investment only. It is the cost per year of service that really counts. And on this basis, brick is always the most economical. ◪ For economy, and smoothness and durability as well, specify modern brick-surfaced pavements.

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CONVENTIONS—WHEN AND WHERE

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JUNE 6-9.—DETROIT, MICH. (1,000)
National Association of Purchasing Agents. Annual convention and Informashow. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

JUNE 6-9.—COLORADO SPRINGS, COLO. (650)
National Tuberculosis Association. Annual meeting. Managing Director, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

JUNE 6-11.—CAMBRIDGE, MASS.
New England Water Works Association. School. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

JUNE 7-8.—ATLANTIC CITY, N. J.
American Water Works Association—Four States Section. Annual meeting. Secretary-Treasurer, C. H. Becker, 400 Chestnut Street, Philadelphia, Pa.

JUNE 7-9.—BUFFALO, N. Y. (1,000)
Conference of Mayors and Other Municipal Officials of the State of New York. Annual convention. Secretary, William P. Capes, City Hall, Albany, N. Y.

JUNE 7-9.—WASHINGTON, D. C.
International Association of Comptrollers and Accounting Officers. Annual meeting. Secretary, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

JUNE 7-10.—TORONTO, ONT. (300)
Smoke Prevention Association. Annual convention. Secretary, Frank A. Chambers, 1411 City Hall Square Building, Chicago, Ill.

JUNE 8-10.—RED WING, MINN. (500)
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, University of Minn., Minneapolis, Minn.

JUNE 10-11.—LACONIA, N. H. (75)
New England Association of Commercial Executives. Annual meeting. Secretary, P. N. Hall, Chamber of Commerce, Westfield, Mass.

JUNE 13-17.—LOS ANGELES, CALIF. (400)
School of Citizenship and Public Administration—University of Southern California. Annual short course. Executive Secretary, Walter E. Sykes, University Park, Los Angeles, Calif.

JUNE 13-17.—LAKE PLACID, N. Y.
Special Libraries Association. Annual convention. Secretary, Rebecca B. Rankin, Municipal Reference Library, Municipal Building, New York.

JUNE 13-15.—DALLAS, TEXAS. (300)
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

JUNE 14-16.—PORTLAND, ORE. (500)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JUNE 14-16.—GRAND RAPIDS, MICH.
Michigan State Fire Chiefs' Association. Annual convention. Secretary, George F. Dansbury, Grosse Pointe Farms, Mich.

JUNE 17-18.—WATERTOWN, N. Y.
New York State Secretaries' Conference. Annual meeting. Secretary-Treasurer, J. Kennard Johnson, Chamber of Commerce, Binghamton, N. Y.

JUNE 19-21.— PORTAGE, WIS. (50)
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary-Treasurer, A. T. Sands, Eau Claire, Wis.

JUNE 20-24.—CLEVELAND, OHIO. (550)
American Institute of Electrical Engineers. Annual summer convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 20-24.—ATLANTIC CITY, N. J.
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 20-22.—STATE COLLEGE, PA. (200)
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa

JUNE 21-24.—NEWPORT, R. I. (700)
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown, 72, Mass.

JUNE 21-23.—CONNEAUT LAKE, PA.
Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Bureau of Municipalities, Harrisburg, Pa.

JUNE 22-23.—EDMONTON, ALTA. (100)
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. E. Fraser, Wetaskiwin, Alta.

JUNE 22-24.—STATE COLLEGE, PA. (140)
Pennsylvania Sewage Works Association. Annual meeting. Secretary, L. D. Matter, Kirby Health Center, Wilkes-Barre, Pa.

JUNE 22-23.—SASKATOON, SASK. (100)
Union of Saskatchewan Municipalities. Annual convention. Secretary-Treasurer, W. E. Hodge, 507 Scott Block, Moose Jaw, Sask.

JUNE 22-23.—MENASHA, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

JUNE 23-24.—GADSDEN, ALA. (100)
Alabama League of Municipalities. Annual convention. Secretary-Treasurer, M. L. Robertson, Cullman, Ala.

JUNE 27-JULY 1.—LAKE OF BAYS, ONT. (500)
American Society of Mechanical Engineers. Semi-annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

JUNE 27-JULY 2.—ATLANTIC CITY, N. J. (12,000)
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1201 16th Street N. W., Washington, D. C.

JUNE 28-JULY 1.—LONDON, ONT.
Ohio State Police Chiefs Incorporated. Annual convention. Secretary, E. G. Krause, 1020 Guardian Building, Cleveland, Ohio.

JUNE 29—JULY 1.—CINCINNATI, OHIO. (1,200)
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 59 East Van Buren Street, Chicago, Ill.

JULY 6-9.—YELLOWSTONE PARK. (500)
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 15-16.—CRAWFORDSVILLE, IND. (50)
Indiana Commercial Secretaries Organization. Annual meeting. Secretary, Glen B. Maple, Chamber of Commerce, LaPorte, Ind.

JULY 19.—NEW YORK. (400)
Union of the Municipalities of the Province of Quebec. Annual convention. Secretary-Treasurer, T. D. Bouchard, 132 St. James Street, Montreal, Que.

JULY 23-29.—LOS ANGELES, CALIF.
First International Recreation Congress and annual meeting of the National Recreation Association. Administrative Secretary, Thomas E. Rivers, 315 Fourth Avenue, New York.

JULY 26-28.—READING, PA. (300)
Pennsylvania Chiefs of Police Association. Annual convention. Secretary, H. S. Carey, Police Captain, Altoona, Pa.

JULY 30-AUGUST 6.—LOS ANGELES, CALIF.
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Whitney Bank Building, New Orleans, La.

JULY 31-AUGUST 13.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. Annual session. Secretary, John N. Van der Vries, 607 First National Bank Building, Chicago, Ill.

AUGUST 16-18.—SPENCER, IOWA.
League of Iowa Municipalities. Annual meeting. Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 23-25.—UTICA, N. Y. (200)
New York State Association of Chiefs of Police. Annual convention. Secretary-Treasurer, James L. Hyatt, 14 Hurlbut Street, Albany, N. Y.

AUGUST 23-25.—KENTVILLE, N. S. (200)
Union of Nova Scotia Municipalities. Annual convention. Secretary, Arthur Roberts, Bridgewater, N. S.

AUGUST 26-27.—ROCHESTER, N. Y. (200)
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 13-16.—ST. LOUIS, MO.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

SEPTEMBER 18, WEEK OF.—WASHINGTON, D. C.
American Civic Association, Inc. American Institute of Park Executives. Annual meetings. Executive Secretary of the Association, Harlean James, Union Trust Building, Washington, D. C. Executive Secretary of the Institute, William H. Walker, 224 Wakewa Avenue, South Bend, Ind.
The National Conference on Government (listed below) will meet in conjunction with these two organizations.

SEPTEMBER 18, WEEK OF.—WASHINGTON, D. C.
National Conference on Government, a combination of the annual meetings of the following organizations: *National Municipal League*, Secretary, Russell Forbes, 309 East 34th Street, New York; *Proportional Representation League*, Executive Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.; *National Association of Civic Secretaries*, Secretary, H. Marie Dermitt, Hotel William Penn, Pittsburgh, Pa.; *American Legislators' Association*, Director, Henry W. Toll, 850 East 58th Street, Chicago, Ill.

SEPTEMBER 22-23.—ERIE, PA.
American Water Works Association—Central States Section. Annual convention. Secretary, B. J. Lechner, Water Department, Erie, Pa.

SEPTEMBER 26, WEEK OF.—SWAMPSCOTT, MASS.
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

SEPTEMBER 27-30.—SPRINGFIELD, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 29-OCTOBER 1.—PITTSBURGH, PA. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 3-7.—WASHINGTON, D. C. (5,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 10-13.—FORT WORTH, TEXAS. (300)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Forth Worth, Texas.

OCTOBER 18-21.—SAN DIEGO, CALIF. (800)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

OCTOBER 23-26.—MEMPHIS, TENN.
National Association of Commercial Organizations Secretaries. Annual convention. Secretary-Treasurer, J. H. Hott, Chamber of Commerce, Fort Worth, Texas.

OCTOBER 24-27.—WASHINGTON, D. C.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 24-26.—CINCINNATI, OHIO.
International City Managers' Association. Governmental Research Association. Joint conference. Executive Director of the I. C. M. A., Clarence E. Ridley, 923 East 60th Street, Chicago, Ill. Secretary-Treasurer of the G. R. A., D. H. Smith, Institute for Government Research, 722 Jackson Place, Washington, D. C.

OCTOBER 31-NOVEMBER 2.—WINSTON-SALEM, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary, Professor H. G. Baity, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 14-18.—WASHINGTON, D. C.
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

NOVEMBER 14-18.—NEW ORLEANS, LA.
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

AT THE TOP OF THE HILL

A LONE figure in overalls surveys the fields of his labor. Freshly planted rows point their even lines around a gently rising hill. Seemingly the world and its people are far away. But this man is not alone!

His home is at the top of the distant hill. And in his home is a telephone. Eighty-five million miles of wire lead to it. His call is a command to one or more of several hundred thousand employees. Day or night he may call, through the Bell System, any one of nearly twenty million other telephones in this country and an additional twelve million abroad.

And yet, like you, he pays but a small sum for a service that is frequently priceless in value. The presence of the telephone, ready for instant use, costs only a few cents a day. With your telephone, you are never alone. It is an investment in companionship, convenience, and security. Through it you can project your personality to the faraway places of the earth, or bring familiar voices to the friendliness of your fireside.

Undoubtedly a great factor in the continued progress and improvement of telephone service is the intangible but real spirit of service that has become a tradition in the telephone business. This spirit expresses itself daily and in any emergency. And behind the army engaged in giving service is the pioneering help of a regiment of five thousand scientists and technical men, engaged in the sole task of working for improvement.

This group devotes itself exclusively to seeking ways and means of making your telephone service constantly better and better.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

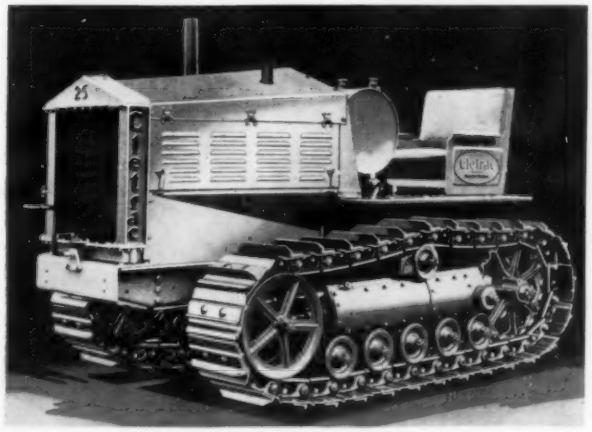
NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A New Model Crawler Tractor

A new medium-sized crawler tractor with a drawbar horsepower of 27 and a belt horsepower of 35, powered with a six-cylinder, four-cycle water-cooled engine, has recently been announced by the Cleveland Tractor Co., Cleveland, Ohio. This new Model 25 Cletrac runs 1.95 miles per hour in low, 2.80 in intermediate, and 4.00 in high. The speed in reverse is 1.83 miles per hour at the governed engine speed of 1,250 r.p.m. The tractor has a planetary compensating differential, actuated by the engine, giving positive power on both tracks when turning. Pressure applied to the steering drum through the steering lever decreases the speed on one side, with proportionate speed increased on the other.

There are one upper and five lower plain bearing track wheel assemblies on each side, with continuous positive lubrication through felt wicking. The total tractive surface is 1,506 square inches. The general dimensions of the tractor are 105 inches long over-all, 57⅜ inches wide and 55¼ inches high at the radiator cap. This tractor will turn in 8½ feet.



THE NEW MODEL 25 CLETRAC CRAWLER TRACTOR

A Traffic Sign Holding Device

A traffic sign holding device which is less expensive than pole brackets or channel iron mountings and which makes possible quick and easy removal of signs for painting or changes in parking regulations has been developed by Thompson Products, Inc., Cleveland, Ohio. This Thompson "Quick-Change" sign unit eliminates the necessity of unfastening or chopping off rusted nuts and bolts, since it consists of a pair of patented keystone clips, a machine slotted bolt and a length of 16-gage band iron. One man with a wrench can erect the unit in a minute or two. The band ends are joined and drawn up tight by turning the slotted bolt. The sign is then inserted in the keystone clip, where it is tight and will not swing or creak and yet can be changed in an instant. These units can be mounted on wood, iron or concrete poles of any diameter and may be adjusted to any position on the pole so as to afford maximum visibility to motorist or pedestrians.

METHOD OF ATTACHING A THOMPSON SIGN UNIT

A Chip Spreader Built for Safe Operation

The A.A. Grits Distributor made by The Greenville Manufacturing Works, Greenville, Ohio, for the spreading of sand and other fine materials on streets and highways, of calcium chloride on gravel roads, and of salt or calcium chloride for eliminating ice, is readily attached to any truck chassis and weighs only 800 pounds. The distribution of the material from the hopper to the roadway is by means of an 8-inch roll which turns either forward or back as desired. Two levers control the flow of chips or chemicals to the roll; one permits the material to flow on the front of the roll when the machine is going forward, and the other onto the back when it is going in reverse. The standard width of the distributor is 8 feet, but it is furnished in any width up to 10 feet. The distributor is so designed that it can spread material over freshly applied asphalt while the truck is backing, thereby preventing picking-up by the truck tires. A platform with a rail is built on the back of the machine so that the man operating it can work conveniently and is in no danger of falling off the machine. The machine is also equipped with side and tail lights, so that night operation is safe. The combination hitch which is built into the machine makes it possible to quickly attach this to any make of motor truck. It is mounted on two rubber-tired wheels.

A Spelter-Coated Sheet for Metal Work

An open hearth special analysis steel base, coated with prime spelter and alloys of other metals having highly rust-resisting qualities, manufactured by a hot process, giving a sheet with a dull etched surface free from spangles to which enamels, paints and lacquers adhere satisfactorily, is a fair description of Galvannealed, a product of the Superior Sheet Steel Co., Division of the Continental Steel Corporation, Canton, Ohio. The high temperature of the heat treating furnace produces a fusion of the zinc coating and the steel sheet, forming a zinc and iron alloy that firmly bonds the coating to the base metal. As the sheets leave the heat treating furnace they gradually cool without disturbing the coating, nor is the coating thereafter injured by varying changes of temperature or severe forming operations. Galvannealed solders and welds readily and its surface is suited to receive paints, enamel and lacquer finishes. No rust particles can develop on this sheet. Superior Galvannealed is soft and ductile, and forms easily under difficult operations, making it particularly adaptable to many of the uses to which sheet metal is put in the municipal field, among them being lockers, shower-bath cabinets, toilet partitions, trash cans and waste receptacles, truck bodies, street signs, moldings and cornices, lamp standards and reflectors.

ONE OF MANY PRODUCTS USED BY CITIES MADE OF GALVANNEALED

OFFICIAL IDENTIFICATION

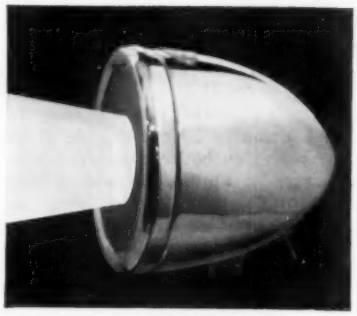
PATROLITE IDENTIFICATION *for* POLICE CARS

Eliminates All Difficulty and Danger in Stopping Violators

PATROLITE is mounted on the right-hand side of the police car. It flashes the signal "STOP-POLICE" IN RED ILLUMINATED LETTERS. If necessary, it enforces this command by directing a powerful SEARCHLIGHT into the violator's vision, making it exceedingly difficult for him to proceed.

PATROLITE can be aimed by the driver in any direction desired, while driving at high speed. When not in use for police purposes, it cannot be distinguished from an ordinary driving light. Cost—no greater than a good spotlight. Easily mounted by any handy-man.

Controlled from steering column or instrument board.


SEARCHLIGHT

Write for Descriptive Literature

Salesmen's and Distributors' Territory Open

PATROLITE MANUFACTURING COMPANY

308 LORAIN ST. BANK BLDG. CLEVELAND, OHIO

this name on your torches means you have THE BEST

the difference lies in the burner

No other safety light can give you so dependable and economical protection . . . yet real TOLEDO TORCHES cost no more than the rest.

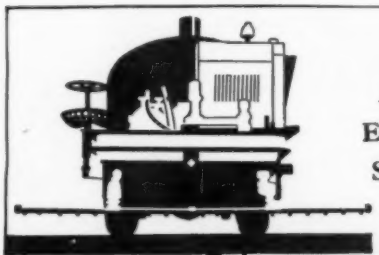
• • •

Your dealer can supply you.

USE THE TOLEDO TORCH NO OTHER SIGNAL MEANS SAFETY

The Toledo Pressed Steel Co.
TOLEDO OHIO

Save with Steel



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THE SIGN OF A GOOD HEATER LB LITTLEFORD BROS.

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BI-LATERAL FIRE HOSE

is an improved construction

It is always reliable for fire service no matter how old, if the jackets are intact. Three tube lining.

The one hose that does not require frequent replacements. Six-year guarantee.

BI-LATERAL FIRE HOSE CO.

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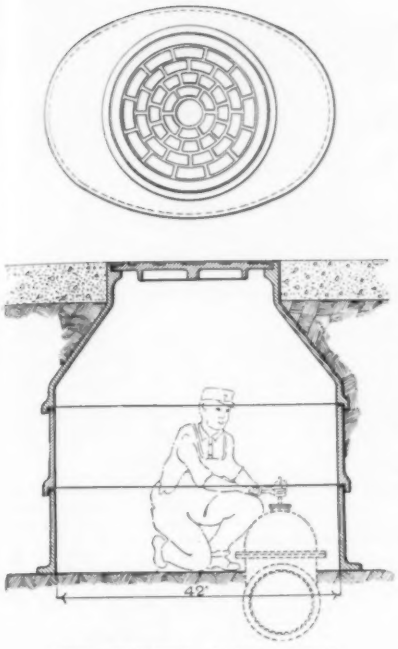


THE CHEMUNG VALVE VAULT

Cast Iron Valve Vaults

A cast iron valve vault, 42 inches in the longer axis of the oval and 24 inches in diameter at the manhole, has been developed by the Chemung Foundry Corporation, 502 Erie Street, Elmira, N. Y. This cast iron vault is made in three sections. The top section containing the manhole is 18 inches high and the two bottom sections are each 12 inches high and identical; thus the vault may be made higher in 12-inch lifts. This construction is designed to replace tile, brick and concrete construction, the oval type permitting a man to work about the valve without being cramped for room. The strength of the cast iron permits the form to withstand severe modern traffic conditions.

A Police-Car Light with Two Uses

Drivers of police cars are frequently faced with the problem of promptly stopping law violators in automobiles. A powerful aid in the performance of this function is provided by Patrolite, a signal light made by the Patrolite Manufacturing Co., 308 Lorain Street Bank Building, Cleveland, Ohio. This assists in either of two ways, as desired: it signals the words "STOP—POLICE" in red illuminated letters on the face of the lamp, which is mounted on the right-hand side of the car in full view of the offenders, or, by the movement of a single switch, it projects an intense searchlight that can be aimed in any required direction, bringing it into the violator's vision and making further progress very difficult. It is easily operated from the instrument panel or steering column, and requires no unusual skill in mounting. When not needed for these special purposes it is excellent as an ordinary driving light, and at such times appears to be one.

Fences for Tennis Courts

A sturdy and durable fencing material is highly desirable in the construction of enclosures and backstops for tennis courts. These qualities are provided by Continental chain-link fence manufactured by the Continental Steel Corporation, Kokomo, Ind., which is strong and resilient, and attractive as well, retaining a trim appearance indefinitely. The mesh, of course, stops all balls. It makes a highly appropriate fencing material for tennis courts in public parks, playgrounds, etc.

Continental chain-link fence is built of wire drawn from special analysis, copper-bearing steel of exceptionally high tensile strength. The finished fabric is evenly and heavily coated by molten zinc. The copper-bearing steel resists inside corrosion, and the hot-dip galvanizing protects against outside rust. There is thus a double safeguard against deterioration.

This type of fencing is also highly suitable for baseball backstops, for bleacher protection, and for fencing purposes generally where strength, durability and true economy are desired.

Leakproof Sewer Pipe Joints

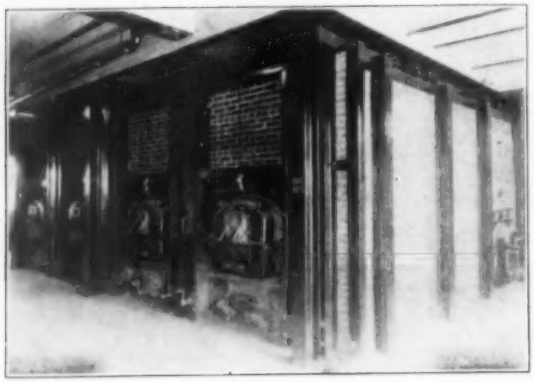
By the use of a special grade of pure asphalt, especially adapted to form a secure and lasting joint with a minimum of cost in material and labor, the Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, Ill., has developed No. 1 Korite. After No. 1 Korite is allowed to set, it is stated, it will safely withstand the customary pressures developed in sewers. It will resist the ordinary alkalinity and acidity of sewage and does not become brittle nor deteriorate with age.

No. 1 Korite can be chopped up and melted in a suitable kettle at a temperature from 250 to 350 degrees Fahrenheit, the lower temperature being preferable. Best results are secured by stirring the kettle from time to time to prevent overheating, and all moisture should be kept out of the kettle, for it will cause foaming. The sewer pipes must be dry and clean when the joint is poured. Before making the joint, the outside of the spigot on the end of the pipe and the inside of the bell of the pipe should be swabbed or brushed with a thin coating of hot Korite. This should be allowed to stand for approximately 15 minutes until the Korite sets or hardens. The pipe then can be lowered into the trench.

The pipes are put together and laid in the usual manner. Oakum is carefully and tightly calked in the space of the joints, leaving at least 1½ inches of open space for the joint. A joint-runner made of asbestos rope, or the standard water-pipe joiners lightly swabbed with kerosene, lubricating oil or with grease, are passed around the pipe and tightly clamped at the top, leaving a triangular opening or gate for pouring the joint material. In making the joint, considerable care must be used in adjusting

CONTINENTAL CHAIN-LINK FENCING IN USE AS TENNIS-COURT BACKSTOPS

PITTSBURGH DES MOINES



100-Ton Incinerator Serves Mansfield, Ohio
PDM Preheater Effects Big Saving

The above Mansfield furnace operates at a minimum temperature of 1500 degrees Fahrenheit in the primary and secondary combustion chambers. The high temperature attained, plus ample combustion chambers, insures complete combustion of all waste and unburned gases. Consequently, there are no odors, no dust and no smoke, or other unburned particles from the "Pittsburgh-Des Moines" plant.

However, all of this 1500 degree heat does not pass up the stack after consuming the garbage and rubbish. These hot gases from the furnace must pass through the cast iron preheater tubes to heat the surrounding air to about 450 degrees. This preheated air blast is in turn forced back to the wet garbage on the burning and drying hearths—thus utilizing about one-third of what would otherwise be wasted heat.

This preheated air has a heat value of between 60 and 70 pounds of coal per ton of garbage destroyed. A "Pittsburgh-Des Moines" incinerator, equipped with a preheater, thus saves a ton of auxiliary fuel for about every 30 tons of garbage destroyed, and in many cases this means complete disposal without auxiliary fuel.

Get more interesting facts on scientific incineration of garbage and rubbish for municipalities from the "Pittsburgh-Des Moines" Catalog. It gives you an authoritative discussion of modern garbage disposal.

Pittsburgh-Des Moines Steel Company

Room 941, 270 B'way New York N. Y.
3452 Neville Island Pittsburgh, Pa.

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San Francisco Chicago Dallas

a watched bearing seldom overheats

But who wants to keep an eye—or a hand—on a bearing to be sure it doesn't, when Dixon's Graphite Cup Grease spreads its cooling, smooth, wear-resisting lubrication to every part of the bearing.

In Dixon's Graphite Cup Grease, finely pulverized Flake Graphite—itself a lubricant—is combined with the finest quality greases. Flake Graphite, brought to the bearing surfaces, takes the load and wear — prevents overheating and scoring. There's economy in such lubrication.

Dixon's Graphite Cup Grease is made in six degrees of hardness—No. 3 is recommended for general use

Give Dixon's Graphite Cup Grease a trial on any bearing—you won't have to nurse it to keep it cool.

Write for Circular No. 107-R

OTHER DIXON GRAPHITE PRODUCTS

Flake Graphite — Belt Dressing
Pipe Joint Compound — Graphite Seal
Waterproof Graphite Grease — Industrial Paint

JOSEPH DIXON CRUCIBLE CO.
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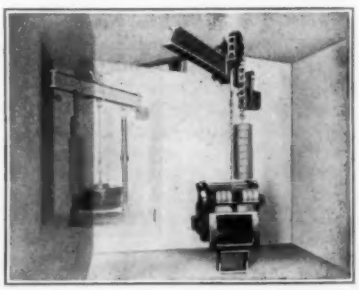
DIXON'S GRAPHITE CUP GREASE

AUTOMATIC SEWAGE REGULATORS

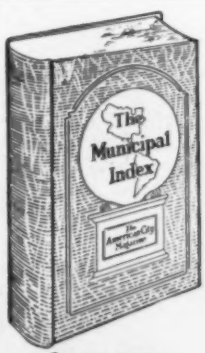
Perfectly Balanced

Easily Installed

Complete Information Upon Request



BROWN AND BROWN, Inc., Lima, Ohio



See our pages 450 to 453 THE MUNICIPAL INDEX

AERO-MIX
AERATOR-MIXER
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Combined Aerator and Mixer

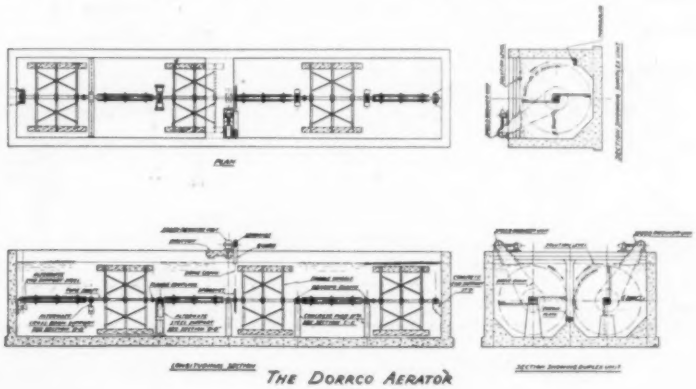
Write for Information

VOGT BROTHERS MFG. CO.
INCORPORATED
LOUISVILLE · · KENTUCKY

A.W.W.A. Valves
"Traffic Model" Hydrants

the joint runner around the pipe. It should be tight at the bell of the pipe so that the hot Korite will not run through to the ground and be lost or wasted. For this reason it has been suggested by the manufacturer, that the temperature of the Korite be only high enough so that it will flow properly when poured in the joints. After the runner has been adjusted, the junction between the pipe and the runner can be made tight by smearing the joint between the pipe and the runner with moist clay. This should not be allowed to get into the joint that is being poured nor to come in contact with a stream of hot Korite, for this will cause foaming and result in a defective joint. Korite cools in about 15 minutes, after which the runner can be removed.

Korite has also been used effectively in waterproofing and membrane construction on steel and concrete bridges.



THE DORRCO AERATOR

New Sewage Aerator

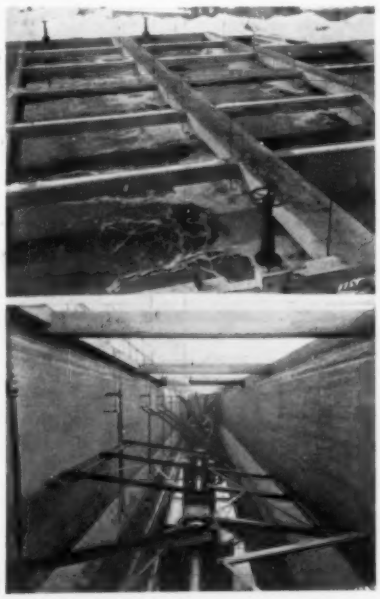
A new type of aerator for use in sewage treatment plants of the activated sludge type has been announced by The Dorr Company, 247 Park Avenue, New York. The distinctive feature of this aerator, which combines mechanical and diffused-air methods, is that the rotary motion of the sewage, induced by the mechanism, operates in a direction counter-current to that of the upward flow set up by the rising bubbles of diffused air.

This Dorrco aerator is furnished in the simplex, duplex and multiplex types, with reference to the number of series of motor-driven paddles for agitation and circulation of the sewage. In the simplex type, having one series of paddles, the diffused air is admitted through a single row of porous plates, set upon a narrow ledge projecting from one side of the tank a few feet above the bottom. In the duplex and multiplex types the porous plates are placed upon one or more elevated ridges along the tank bottom and between the paddle shafts so that each row of plates serves the two series of paddles adjacent to it. These tiles are readily removable for inspection and cleaning and are provided with valves and extension stems for regulating the volume of air admitted to each section. By driving the paddles downward against —not upward with—the stream of rising air bubbles, the period of contact between air and sewage is increased, the air is distributed across the complete width of the tank, and the amount of air required to secure a definite biological result is materially decreased.

Many paddle-wheel units are attached at regular intervals to a single shaft passing axially through the tank. Each unit is made up of two diametrically opposite flat paddles, attached to the ends of three steel radial cross members which in turn are secured to and rotate with the shaft. Adjacent paddle units are 22½° out of phase with each other for better mixing and better dynamical balance. Between these units are placed the bearings for supporting the main shaft, either from the sides or from the bottom of the tank.

The entire mechanism is below the water level, and the tips of the paddle blades clear the sides and bottom of the tank and the water surface by half a foot or so. The drive simply consists of chain and sprocket connection to a motor and speed reducer at the top of the tank.

The Dorrco aerator may be supplied for both new and existing tanks in a wide range of diameters corresponding with various tank sections and, because of the sectional type of construction, may be built up to any reasonable length, with or without multiple drive units.



THE DORRCO AERATOR
(Top) Full and operating
(Bottom) Empty, showing construction

Dorrco aerators are installed at Escanaba and Muskegon Heights, Mich., and at Phoenix, Ariz. Tests at two of these plants have yielded certain comparative operating data on this aerator and aerators of the conventional straight, diffused air type. Whereas the diffused air type generally requires 0.8 to 1.5 cu. ft. of free air per gallon of sewage and 20 to 35 hp. input per million gallons, the Dorrco aerator secures the same biological result, measured by B.O.D. reduction, with 0.3 cu. ft. of air per gal. and a total power input of 15 to 18 hp., divided almost equally between compressing the air and revolving the paddles.

During the nightly period of minimum load, with average domestic sewage, compressed air need not be used. No appreciable change in the B.O.D. of the final effluent is caused by this practice, and obviously the shutting down completely of the air-compressor plant for eight hours a day makes it possible to realize still greater operating economies.

Sanitation Around Swimming Pools

Athlete's foot, the popular designation of ringworm of the hands and feet, or dermatophytosis, has become one of the most widespread skin diseases of the country. Its germs thrive where there are warmth and moisture, and are prevalent on floors around swimming pools and in shower rooms, locker rooms and drying rooms. Infection usually occurs by contact of the bare feet.

While the germs resist both hot water and drying, they are readily destroyed by a solution of Alta-Co, an odorless antiseptic prepared by the C. B. Dolge Co., of Westport, Conn. For this purpose it is diluted with four or five parts of water and applied with a mop to floors and dressing benches.

Diluted with ten parts of water it is used to disinfect and deodorize sinks, receptacles, toilet bowls, etc., and for daily spraying in rooms and corridors of schools, hospitals, institutions and other buildings, to prevent contamination and combat respiratory diseases.

Further Results of Paint Test

As announced in these columns previously, the Pittsburgh-Des Moines Steel Co. and the borough of Ambridge, Pa., are jointly conducting an extensive test of paints for the interiors of water tanks. The results of the seventh inspection of the 196 paint panels on April 15, after 186 days of exposure, are shown below, in per cents of original condition:

Classification	*Average Rating*
Hot bituminous coatings	90.3%
Red lead and linseed oil paints	84.8
Asphalt emulsions (plain)	82.5
Aluminum paints	81.9
Thick plastic coatings	80.1
Elaterite coatings	79.7
Coal tar paints	73.9
Asphalt emulsion and filler	69.7
Clear varnish finishes	68.1
Synthetic gum vehicle	64.1
Misc. cold bituminous paints	61.6
Other linseed oil paints	56.0
Gilsonite asphalt paints	44.7
Pyroxolin base paints	38.5

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LET US SUGGEST THE METAL

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Page offers a wide range of styles in four different metals—each supremely resistant to corrosion—each doing its best work under special atmospheric conditions:

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3 Page Copper-Bearing Steel
4 Page Highland Wrought Iron

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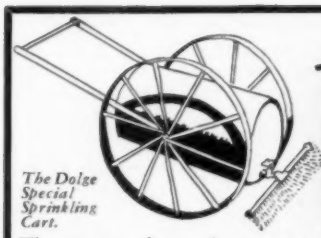


The Dolge Special Sprinkling Cart.

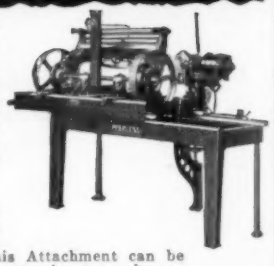
1 OPERATION KILLS ALL THE WEEDS . . . GALLON COVERS 1250 SQ. FEET

The most modern—the most economical way to kill weeds, poison ivy and rank growth is with Dolge weed killer. One gallon covers 1250 square feet. Easily applied. Great for park walks, drives, golf courses, playgrounds, tennis courts.

Write Dep't. AC 1 for full information regarding free lease of sprinkling carts, Dolge guarantee, and free testing privilege.

THE C. B. DOLGE COMPANY
WESTPORT, CONNECTICUT

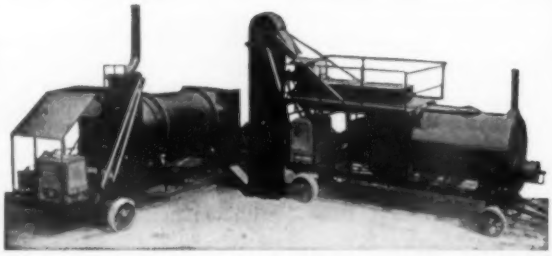
THE PEERLESS MOWER SHARPENER !



The New Model D Peerless Mower Sharpener grinds all types of power-driven, fairway, putting green and hand mowers without removing mower wheels or reel knives. Carriage has travel of 42 inches. Grinds with amazing speed and accuracy. 6-inch grinding wheel driven by ½-hp. motor and V belt. Very quiet running.

Reconditioner Attachment furnished at an additional price for "lapping in" putting green mowers with emery paste. This Attachment can be quickly clamped to the Sharpener by two clamps. Write for Catalog.

THE FATE-ROOT-HEATH COMPANY
132-168 BELL STREET, PLYMOUTH, OHIO



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FOR MAKING HOT AND COLD MIXES

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PERMANENCE

Is an inherent characteristic of Brass street signs. Brass, the non-corrosive metal, is used in their construction.

Write for a list of Brass street sign installations that have stood the test of time.

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UNION IRON PRODUCTS CO.
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ROOT TRUCK SPEED MAINTENANCE

A model for any size truck. Now furnished with Hydraulic or Pneumatic (air pressure) operation. Now is the time to cut the cost of street maintenance with a machine that will leave all street surfaces in smoothest condition.

Send for additional information
(Patented 5/10/1932)

ROOT SPRING SCRAPER COMPANY
Kalamazoo, Michigan

New Traffic Control for Washington, D. C.

Washington, D. C., has recently awarded a contract for Eagle controllers to take care of 117 intersections. For over a year 25 intersections in that city have been equipped with the control apparatus of the Eagle Signal Corporation, Moline, Ill. An order has also been placed with the same company for Eagle flexible progressive traffic signal equipment by the cities of Charleston, W. Va., and Memphis, Tenn.

A Revolving Nozzle Type Sludge Collector

In order to eliminate the necessity of moving sludge all the way from the periphery of a circular tank to the center, the Chain Belt Co., Milwaukee, Wis., developed the Two-Bro type sludge remover, consisting of a battery of nozzles which in sweeping around the tank remove the sludge with the minimum of agitation.

The revolving headers are located about 30 inches above the tank bottom and the mechanism does not move the sludge in the tank but removes it through the nozzles and headers from the place where it settles in the tank bottom. The clarifier mechanism consists of a vertical revolving shaft having near its lower end two radial pipe headers, diametrically opposed, and located parallel to the tank bottom and 30 inches above it. Each header has a series of sloping inlet nozzles which just clear the bottom of the tank and which are uniformly spaced from the center to the outer end and so arranged that the nozzles on both headers will in a single revolution of the headers sweep the entire bottom of the tank. The inner ends of the headers converge into a central outlet connected to the sludge pipe line. The slowly revolving mechanism collects the sludge from the tank bottom and carries it through the headers to the central outlet, the removal being done by hydrostatic pressure. The shaft and header units are revolved by means of drive machinery located on a bridge spanning the tank.

The headers and nozzles are made of cast aluminum alloy in sections of suitable length flanged and bolted together. At regular intervals the inlet nozzles, which have flared openings for collecting the sludge, are bolted to the headers. The headers discharge into a cast iron reducing tee which revolves on a large bronze bearing approximately 1 foot above the tank bottom. The mechanism in the water revolves on this bearing, which is lubricated with waterproof grease through copper tubing from a central point in the house over the drive unit.

The sludge outlet is through the center bottom of the tank and is made entirely of standard cast iron flanged fittings. The revolving reducing tee is shaped so that the two streams of sludge from the pipe headers will not directly oppose each other in entering the outlet. The center portion in the tank bottom is grouted after the outlet fittings are placed, to insure proper alignment and setting of the mechanism. A final draining fitting with a brass plug is also provided for draining purposes and will allow the tank to be emptied after the liquid has been drained as far down as the revolving headers.

For larger-sized tanks a standard bridge with two trusses supports the drive unit and carries the connection for the drive machinery. The drive unit is covered with a house which has a checkered floor plate. Access to the house is from either end of the bridge by means of the checkered floor plate walkway with two hand rails on each side of the walk. For smaller tanks the drive unit is supported by two beams set flush with the top of the tank or slightly above it, and these are braced sufficiently heavily for the work intended. Subway grating is provided as a walkway from either side of the tank to the center with a two-line pipe rail on each side of the walk.

A Spiral Welded Water Pipe with Smooth Interior

A spiral-welded pipe which possesses ample strength to withstand the service pressures for which it is designed and which is built with wall thicknesses from 7/64- to 3/8-inch and in sizes from 6-inch to 30-inch is made by the American Rolling Mill Co., Middletown, Ohio. The walls are fabricated from heavy-gage coil plate, joined by helical welds that are stronger than the plate material itself. The strength is distributed uniformly over the entire wall area, and yet there is sufficient flexibility to overcome the hazards to which rigid pipe structures are exposed. The fact that the pipe has a smoother interior, is round and straight, light and strong, has a uniform wall thickness without surplus material and is made in 40-foot lengths, makes it of interest to water-works engineers interested in economical installation.

TWO MEN CAN READILY CARRY A 40-FOOT LENGTH OF 8-INCH ARMCO SPIRAL PIPE

Two workmen of normal strength can shoulder a 40-foot section of 8-inch diameter standard pipe and carry it to the trench, thus reducing the cost of installation greatly. Armco spiral welded pipe is available either asphalt-dipped or galvanized for water-works service.

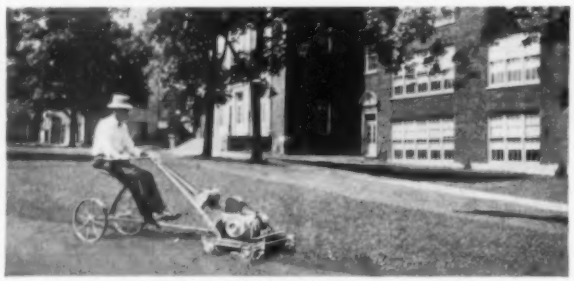
Chicago Representative of Homestead Valve

Lietz Engineering Co., 2354 Lincoln Avenue, Chicago, has been appointed exclusive representative of Homestead Valve Manufacturing Co., of Coraopolis, Pa., on the sale of valves and Hypressure Jennies.

AN INSTALLATION OF THE TOW-BRO SLUDGE COLLECTOR SYSTEM

COLDWELL

SINCE 1867



Above: Coldwell "Twin-Thirty" motor lawn mower and roller. Mows and rolls simultaneously 6 to 8 acres a day on one gallon of gasoline. Riding sulky may be had as extra equipment.

Dependable Lawn Mowing . . . . . Equipment Since 1867

IF you are concerned about the condition of your lawns and the expense of maintaining them, you are invited to send your problem to us for solution. Tell us the extent of your lawns and state whether hilly or level and we will suggest the most dependable and economical style and size of mower for your use.

A Coldwell will do it better, with less help and at less expense.

Sales and Service Stations throughout the Country

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.

In Canada—Taylor-Forbes Co., Ltd., Guelph

Manufacturers of ***DEPENDABLE*** *Lawn Mowers—*HAND, HORSE, GASOLINE, ELECTRIC

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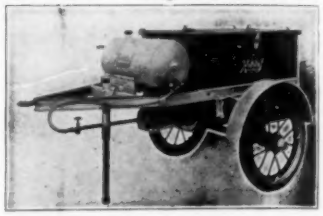
FOR ECONOMICAL MAINTENANCE USE HOTSTUF ASPHALT EQUIPMENT

SAVE { TIME, LABOR, FUEL, MATERIAL



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Dealers in Principal Cities

MOHAWK ASPHALT HEATER CO.

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SANI-TITE

A DEPENDABLE SEWER JOINT COMPOUND

By the Manufacturers of

HYDRO-TITE

Reg. U. S. Pat. Off.

ADVANTAGES

Makes strong water-tight joints.
Gives better adhesion to tile or concrete.
Has high hydrostatic and tensile strengths.
Resists alkalinity or acidity of sewage or ground.
Makes it impossible for tree roots to enter.
Gives flexibility without any sacrifice of strength.
Prevents infiltration even after considerable settling of the pipe.
Sets quickly after the joint is made.
Will not become brittle or deteriorate with age.

Shipped in 300 and 400 lb. Drums (Average Weight)

HYDRAULIC DEVELOPMENT CORPORATION

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the MARCY

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VACATION SPOT SUPREME!

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THE MARCY

AMERICAN PLAN

Rates to Fit Every Purse

A NEW BITUMINOUS DISTRIBUTOR

A New Distributor for Oil, Tar and Asphalt

A new line of bituminous distributors built in 600-, 800-, 1,000-, 1,200- and 1,500-gallon capacities to handle all grades of oil, tar and asphalt, and designed for mounting on any standard truck chassis, has been announced by The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill. Mountings of these Austin units can also be made on trailers and semi-trailers.

Any desired uniform quantity of bitumen per square yard may be applied over any specified width. Spray bars or manifolds of welded sheet metal construction are tapered to correspond with the reduction in volume and to provide drainage when they are removed. If preferred, a full circulating boot-type manifold, with individual nozzle shut-offs working in gang formation, can be provided. The nozzles and valve controls are inside the manifold pipe, where the heat makes for immediate and complete drainage. The tanks are elliptical in shape to provide a low center of gravity, and each has a sufficient expansion zone above. All seams are electrically welded and tested under pressure for water-tightness. A full-size manhole with a non-breakable quick-clamping lid and a 2½-inch vertical overflow is standard equipment. Asbestos lagging with a sheet-metal cover can be provided if desired.

The provision for heating includes two large double U-tube flues with generating non-carbonizing type burners which operate with kerosene or light furnace oils. Before the heat leaves the smoke-stack at the front, it must pass through ten smaller flues, spaced to break up the asphalt mass into small volumes. The fuel storage and air-pressure tanks have a capacity sufficient for a day's run. If steam coils are desired instead of the U-tube construction, a double set of removable coils having eight lengths of tested pipe can be furnished.

The pump is of the internal gear type, with but two moving parts, and has a capacity of 350 gallons per minute at 350 r.p.m. It is also equipped with a self-aligning anti-friction outboard bearing. The straight-through pattern with suction at bottom eliminates objectionable pockets where asphalt would otherwise lodge in heavy quantities.

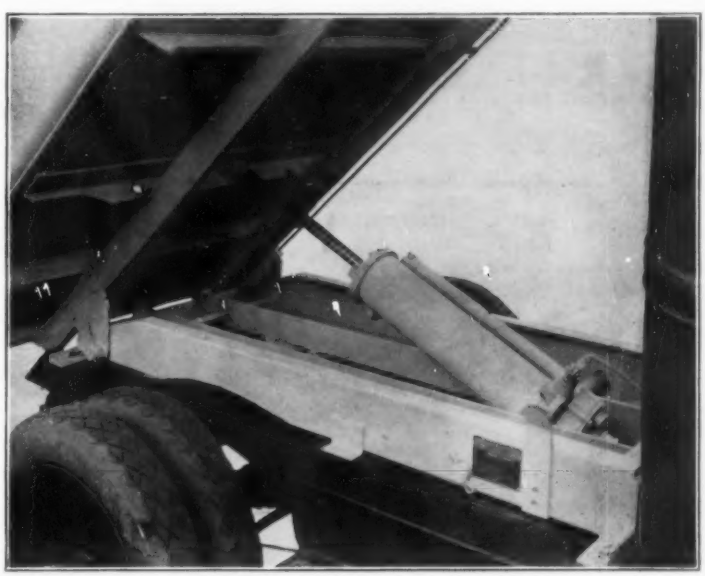
Lubrication, grease cups and packing glands are in an accessible location. A heavy-duty and easily accessible 4-cylinder motor drives the pump. It is placed at the front of the distributor to eliminate fire hazard and to prevent the mist and fine spray of asphalt from causing ignition trouble, short circuits or a clogged cooling system. The governor and gas throttle rods are extended to the rear, giving the operator complete control of the machine. The front and rear piping is assembled in an upright position to permit natural drainage and easy starting. Flanged pipe fittings and metallic tubing are included in the design to prevent leaky joints; the valves and shut-off cocks are of the inverted plug, spring loaded type, kept tight at all times by internal springs. The pump and front end fittings are fully enclosed in an asbestos-covered heat chamber. The piping arrangement allows for full circulation within the tanks, and a by-pass line also permits complete exterior circulation around the pump for wash-out or cleaning purposes.

These new Austin distributors are furnished with modern operating features as well as a complete line of auxiliary equipment.

A Heavy-Duty Hydraulic Hoist

A rugged, powerful hydraulic hoist with a heavy-duty 6-inch cylinder, and with low oil pressure, has recently been announced by the Galion Allsteel Body Co., Galion, Ohio. The oversized cylinder is carefully reamed and honed, and is fitted with a heavy cast semi-steel piston and steel piston rings. The entire assembly is simple and with few parts. High-pressure pipe lines and all screwed connections have been eliminated. The hoist is completely assembled at the factory to simplify handling and mounting by users.

The subframe is a one unit type built all of steel. The drive shaft cannot be thrown on a twist, or distorted or subjected to strain, because of the self-aligning bearing, which automatically adjusts and aligns the drive shaft under all conditions. The heavy-duty pump is affixed directly in the cylinder head, thus eliminating all of the high-pressure pipe line connections. A full-sized 2-inch shaft is used as a pivot for the cylinder. Two full-length 8 x ½-inch thrust bars further support the pivot shaft of the cylinder, tying the subframe rigidly together.



THE NEW GALION HYDRAULIC HOIST

Ballard in Tulsa, Okla.

Luke L. Ballard has resigned the vice-presidency and membership in the Board of Directors of the Badger Meter Manufacturing Co., of Milwaukee, Wis., owing to a continuation of bad health for the past nine months, and is now recuperating in the Southwest. His temporary headquarters are at 1540 North Denver, Tulsa, Okla. He has been connected with the Badger Meter Manufacturing Co. for some twelve years. The climatic conditions of Milwaukee are such that Mr. Ballard finds it impossible to remain in that section. His business plans for the future are indefinite, pending the full recovery of his health, which is gradually improving.

Successful Resuscitations

With H-H INHALATORS!

Inhalation of petroleum vapors, gas, smoke, carbon monoxide and other poisonous fumes causes oxygen deficiencies in the lungs. The chances of successful resuscitation are greatly enhanced when the H-H INHALATOR is used as an adjunct to the prone pressure method of artificial respiration. Acquaint yourself with this well-known and successfully used safety appliance today.

WRITE FOR COPIES OF BULLETIN NO. 80

Mine Safety Appliances Co.

Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

"EVERYTHING FOR MINE AND INDUSTRIAL SAFETY"

ROLLERS

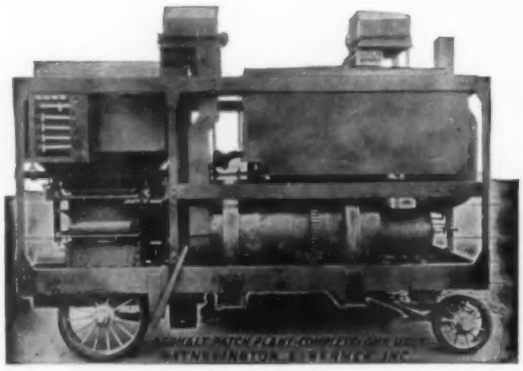
TIME....

A vital factor on many contracts, as every contractor knows. Time, the loss of which may quickly turn a prospective profit into a certain loss.

In so far as rolling operations go, insure yourself by employing the roller in which you can place greatest dependence—The Buffalo-Springfield.

Three wheel and tandems, steam or motor driven. Range of sizes and weights. Scarifier and other attachments optional.

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO



A Real Asphalt Patch Plant

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

HETHERINGTON & BERNER, INC.

INDIANAPOLIS, IND.

Stationary — Railway — Portable & Semi-Portable Plants

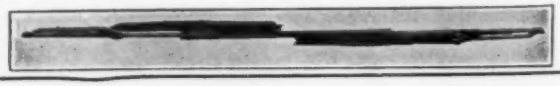
Above: McCurdy Road Guard in Use
At the right: Collapsed for moving to the next job

McCurdy Road Guards

All—Steel—Adjustable—Collapsible

It's a quick and easy matter to close a street to traffic while repairs are going on, if you own a pair of McCurdy Road Guards. They are easy to transport to the job—simply carry them collapsed on your running board. You can set one of these guards up in one minute—and take it down and collapse it in one minute when the job is finished. Being made of all-steel, a McCurdy Road Guard will stand all kinds of hard knocks and won't break or wear out in many long years. It's considered everywhere the most efficient and economical road guard obtainable for street repair work. Price $5.80 each. Write for our illustrated circular.

McCurdy Steel Products Company
Ada, Ohio



ARMCO PART-CIRCLE MULTI-PLATE PIPE INSTALLED UNDER A ROADWAY

A New Part-Circle Drainage Pipe

A new product designed to meet the need for a strong drainage structure which will give adequate waterway areas without the headroom necessary for a full-round pipe, has recently been announced by the Armco Culvert Manufacturers Association, Middletown, Ohio. This part-circle multi-plate pipe makes possible a flow area equal to 60- and 84-inch and larger full-round pipe where the height of the roadway makes the installation of those sizes of pipe undesirable or impractical.

Armco part-circle multi-plate pipe is manufactured with 3-, 4- and 5-arch plates which form spans ranging from 90 to 220 inches and in lengths of 5 feet or multiples of that number. The arch plates are available in any of the three standard gages, 3, 5 or 7. The ends of the base plates are turned up 4½ inches so that the arch can be bolted to the base. Corrugations are 6 inches from crest to crest and 1½ inches deep. The sides of the base plate are turned down with a 4½-inch lip to give stiffness and ample strength to prevent buckling under ordinary shallow fills where this type of installation would be used. The base plates are held together by the corrugated arch plates by bolts through the end flanges. All plates, both flat and corrugated, are of Armco ingot iron.

Pittsburgh Equitable Appoints Parker

The Pittsburgh Equitable Meter Co. announces the appointment of Walter Parker as Chief Engineer of the Liquid Meter Division. Mr. Parker, a graduate of North Carolina State University, in mechanical engineering, was formerly Chief Engineer of the Fry Pump Co., and has had long experience in designing and building water and oil meters and related equipment. Prior to his appointment he was doing special engineering work for the company.

Water Works Entertainers

"Joe" Wafer, Assistant Sales Manager of Industrial Chemical Sales Co., Inc., 230 Park Avenue, New York—the well-known "Nuchar Crooner"—added to his reputation by being selected as soloist at the annual banquet of the American Water Works Association held during the convention at Memphis on May 4. His rendering of old-time ballads was full of pathos, and sympathetic reactions were distinctly noticeable in the audience. He was ably accompanied by versatile "Bill" Orchard, General Sales Manager of Wallace & Tiernan Co., who also assisted in performing on the "Raddiolodion."

Welded Bridge Railings

To satisfy modern requirements, all parts of a bridge must have structural strength, and in addition, the effect must be pleasing. The protective barriers for pedestrians and vehicular traffic play an important part from an architectural viewpoint.

Bridge railings that incorporate both beauty and strength have been developed and are now being manufactured by the Anchor Post Fence Co. of Baltimore, Md.

The existing varieties and types of bridge railing design are legion; but frequently over-attention to structural strength has necessitated too much ornamentation to offset the crudity of the basic lines, with the result that these railings are ungainly and over-emphasized.

Combinations of horizontal rails with vertical pickets repeated hundreds of times along the bridge can either create a desirable or a disturbing impression. Certain features of design control this result, namely, correct proportioning and the assembling of all lines so that they harmonize; also, the introduction of sufficient relief to overcome monotony.

The Anchor Weld bridge railing, by the use of architecturally correct materials and proper proportioning, is made a well-balanced and harmonious part of the bridge structure. Sufficient relief through the use of ornamental moulding makes the railing graceful yet dignified.

As to the strength of the railing, a minimum uniform load of 150 lbs. per linear foot applied at the top rail without stressing beyond the elastic limit of the material is generally specified, without any requirement covering shock loads. The possibility of impact is very slight and when it does occur, it is generally low in energy effect, due to roadway curbs decreasing the momentum of the impacting body, and also because the shock rarely occurs head on, but nearly always tangentially.

Tests of the Anchor Weld bridge railing performed under the supervision of Robert W. Hunt Co., Engineers, showed the following results:

RESULTS OF TEST, PANEL NO. 2

Applied Load Lbs.-Oz.	Load Per Linear Ft. (Approx.) Lbs.	Deflection Inch	Permanent Set (Inch) After Load Removed
401- 5	45.0	0.135	0
807- 0	89.5	0.249	0.004
995- 8	110.5	0.303	0.004
1191-13	132.0	0.347	0.004
1397-13	155.0	0.409	0.004
1590-13	177.0	0.456	0.010
1795- 9	198.0	0.495	0.011
2088-13	223.5	0.586	0.018
2392- 3	265.0	0.674	0.023
2689-13	288.0	0.759	0.028
2995- 8	332.0	0.825	0.032
3598-15	399.0	0.996	0.046
4198-11	415.0	1.112	0.056

This panel was tested as a simple beam with supports nine feet apart. The uniform load was placed along the top rail to simulate a horizontal force applied at the top of the railing when actually in service.

The strength of the Anchor Weld bridge railing is accomplished by flange-welding each of the grooved square pickets between two grooved bars that form the horizontal rail of the fence. Thus pickets and rails are united into solid panels. Each picket becomes a rigid support. Panels cannot buckle or sag.

The same superior qualities of engineering design, construction and craftsmanship are incorporated in the other Anchor products: chain link fences for city property, playground equipment, and Anchor Weld iron fences and gates.

Morris' Cleveland Office Moves

Morris Machine Works, Baldwinsville, N. Y., manufacturers of centrifugal pumps for municipal water supply, sewage disposal, industrial plant services, and handling chemicals, pulp, sand and gravel, and other abrasive materials, announces that the Cleveland office has been removed to Western Reserve Building, West 9th Street and Superior Avenue.

A PANEL OF ANCHOR WELD BRIDGE RAILING

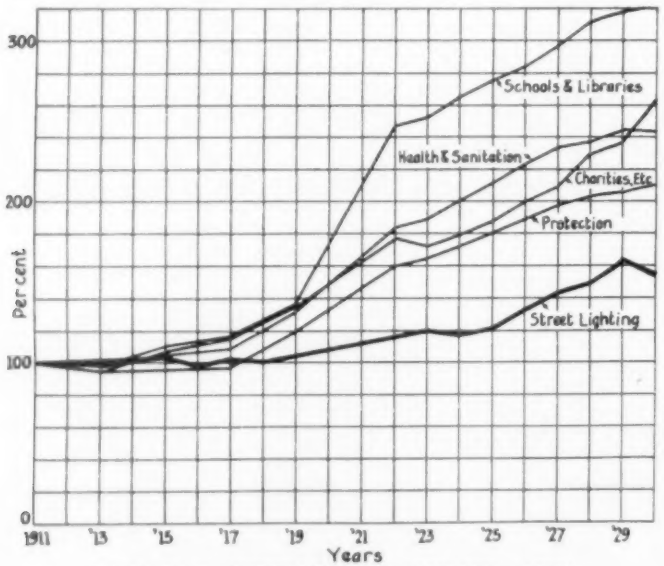
Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

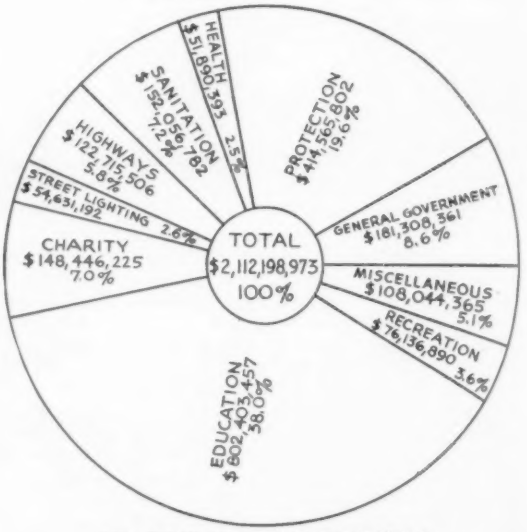
Street Lighting Costs Little, Does Much

THE two diagrams below, which are based on statistics of the United States Bureau of the Census for 1930 (just released) and earlier, emphasize two aspects of street-lighting expenditures that have an important bearing on the unfortunate tendency in a few cities to cut down on street lighting, as one of the readily available possibilities in trimming a few dollars from the budget. They are, that the per capita expenditure for street lighting has been increasing at a much lower rate than for such municipal activities as education, health, charities and protection (and actually decreased from 1929 to 1930); and that street-lighting cost constitutes only 2.6 per cent of the total.

What the diagrams do not show is the fundamental importance of street lighting as an invaluable aid in the campaign against accidents and crime, effectively supplementing at little cost the much greater expenditure for policing the community against criminal violence and traffic hazards during the hours of dusk and darkness.



INCREASE IN STREET-LIGHTING COST PER CAPITA COMPARED TO OTHER MUNICIPAL ACTIVITIES
Percentage comparison, 1911 to 1930, of per-capita expenditures for various municipal functions in all cities of over 30,000 population



1930 COSTS OF CITY DEPARTMENTS
Payments for operation and maintenance of general departments of the 310 cities of over 30,000 population, and percentages of the total. Figures for highways are exclusive of street lighting, which is here segregated. Total population, 47,431,000; total per-capita expenditure, $44.53; per-capita street-lighting expenditure, $1.15 or 2.59 per cent.

Bridgeport, Conn., Dedicates New Lighting

TWO hundred and fifty 6,000-lumen street lights have just been installed along an important thoroughfare in Bridgeport, Conn., thus extending the benefits of adequate lighting, rather than lessening this essential municipal activity because of discouraging business conditions. The new lamps are on Fairfield Avenue, which forms a part of the famous Boston Post Road, connecting New York and Boston, and provide five miles of high-intensity illumination.

The new lighting units are incandescent, replacing old luminous arcs, and are equipped with redirectional reflectors that provide uniform diffusion of the light toward the roadway and minimize waste beams. Rippled glass globes are used. The spacing is 200 feet on each side, with staggered arrangement, giving one lamp to 100 feet of roadway. The units were installed by General Electric Co. engineers.

Mayors of all Connecticut cities were invited by Mayor E. T. Cunningham to the official opening of the new system. Mayor Cunningham switched on the lights in the presence of the visiting mayors and other officials interested in street and highway lighting, including Robbins B. Stoeckel, State Commissioner of Motor Vehicles, and John A. Macdonald, State Highway Commissioner. Following the inauguration of the system a carnival, sponsored by the business men of the avenue, was held.

A visibility test was conducted by General Electric street-lighting specialists on Cortland Avenue, just off Fairfield Avenue, and was witnessed by a large number of spectators. It was convincingly demonstrated that an automobile driver upon an unlighted highway cannot, by the light of his own headlights, see a pedestrian ahead wearing dark clothes, until too close to avoid an accident. The effect of headlight glare upon oncoming drivers was also shown.

Lighting Units on Express Highway

THE West Side elevated express highway in New York City, the second portion of which was recently opened to traffic, is provided with several interesting designs of lighting fixtures for the upper roadway and for the street surface below. Lamp sizes used are 500-watt (9,500-lumen) for the twin and bracket fixtures, and 200-watt (3,240-lumen) for the units under the deck. The twin-lamp posts are in the center and about 80 feet apart, for the most part; the light sources are about 19 feet above the roadway.

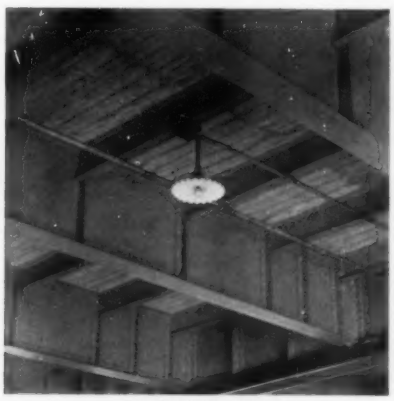
The southern portion of this highway, from Canal Street to 23d Street, constructed two years ago and extending a distance of over a mile and a half, is built over the middle portion of West Street, thus having street surfaces underneath and to each side, chiefly for truck traffic. The new section, from 59th Street to 72d Street, is over the tracks of a railroad freight yard.

TWIN-LAMP POST
Special ornamental design, at southern approach

TWIN-LAMP POST
Type in general use on upper roadway

BRACKET UNIT
Mounted on stone facing of approach structure

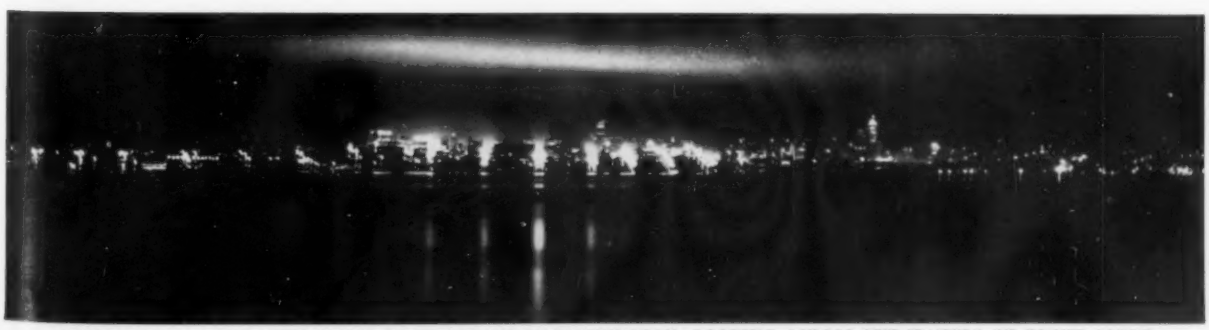
BRACKET UNIT
Mounted on steel structure



OPEN-TYPE UNIT
Mounted with reflector under deck

BRACKET UNIT
Close-up of unit shown above

The Lights of Seattle



NIGHT VIEW OF THE METROPOLIS OF THE STATE OF WASHINGTON, LOOKING ACROSS THE WATERS OF PUGET SOUND

Write for this Bulletin—

"SAVING SOCIAL WASTE BY BETTER STREET LIGHTING"

It explains how poor street lighting helps the criminal and hinders the police. . . . And it proves from the actual experience of municipalities how adequate street lighting prevents crime.

This bulletin also shows conclusively that a large percentage of traffic accidents at night are due to poor lighting—and shows how good lighting reduces this tremendous social waste.

HOLOPHANE Refractors are a paying investment for every city because they cut down costly losses in traffic accidents and night crimes.

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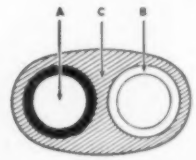
THEY PROVIDE THE GREATEST AMOUNT OF USEFUL LIGHT

TRADE **LATOX** MARK

RUBBER SHEATHED

TWIN LAMP CORD

"With the safety web between conductors"



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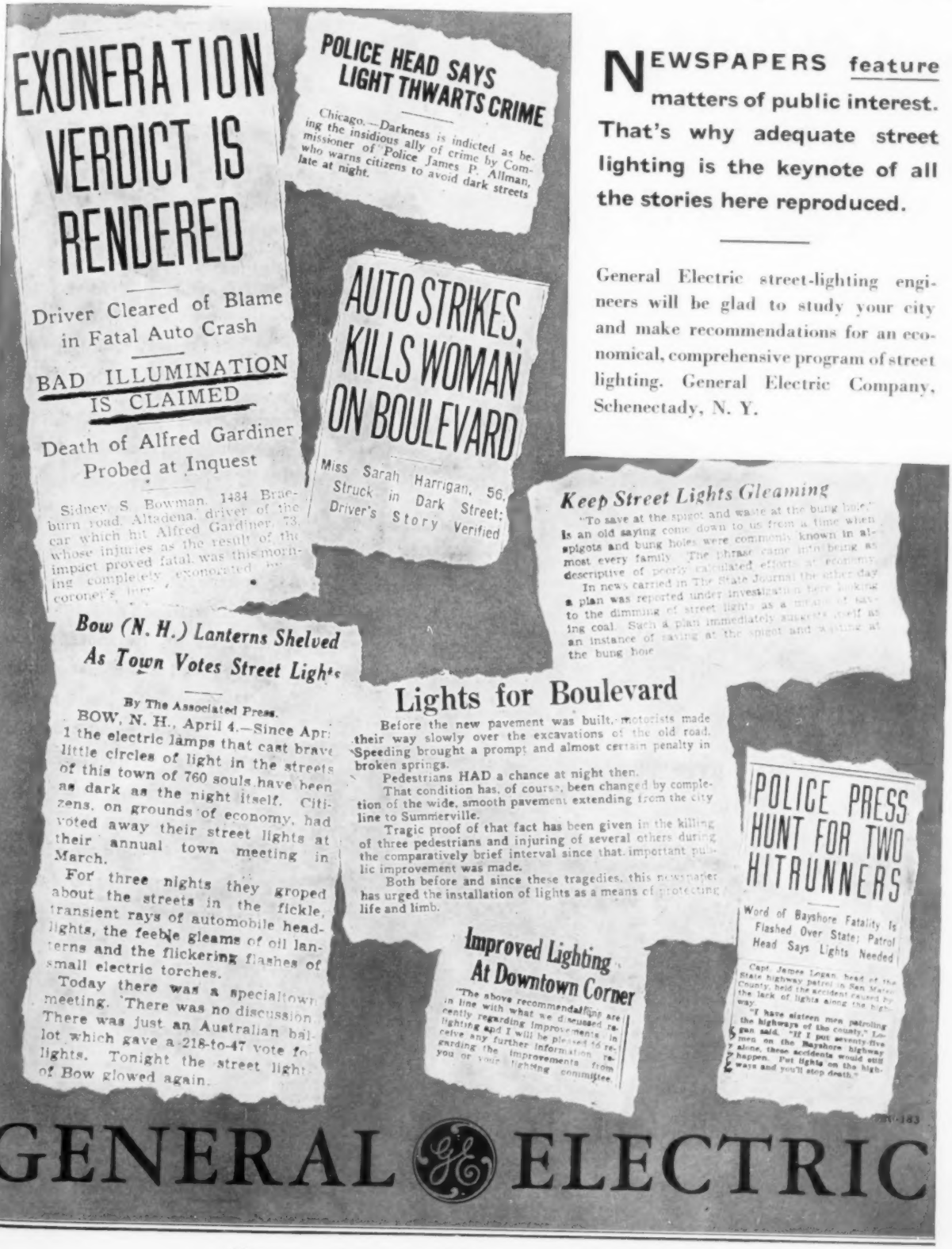
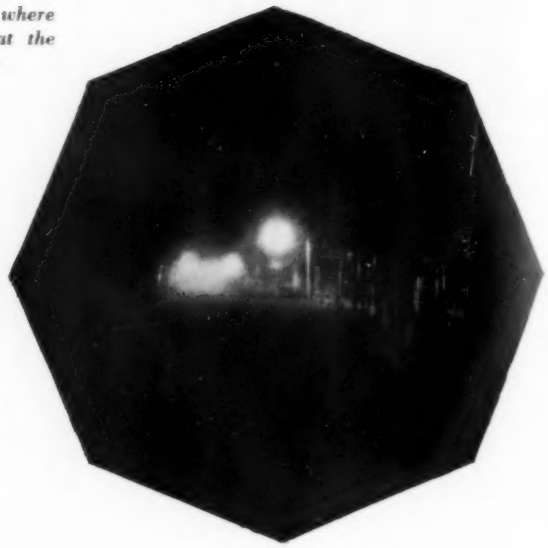
Newspapers Feature the Value of Adequate Street Lighting


EXONERATION VERDICT IS RENDERED
Driver Cleared of Blame in Fatal Auto Crash
BAD ILLUMINATION IS CLAIMED
Death of Alfred Gardiner Probed at Inquest
Sidney S. Bowman, 1484 Braeburn road, Altadena, driver of the car which hit Alfred Gardiner, 73, whose injuries as the result of the impact proved fatal, was this morning completely exonerated by the coroner's jury.
POLICE HEAD SAYS LIGHT THWARTS CRIME
Chicago.—Darkness is indicted as being the insidious ally of crime by Commissioner of Police James P. Allman, who warns citizens to avoid dark streets late at night.
AUTO STRIKES, KILLS WOMAN ON BOULEVARD
Miss Sarah Harrigan, 56, Struck in Dark Street; Driver's Story Verified
Keep Street Lights Gleaming
"To save at the spigot and waste at the bung hole" is an old saying come down to us from a time when spigots and bung holes were commonly known in almost every family. The phrase came into being as descriptive of poorly calculated efforts at economy.
In news carried in The State Journal the other day a plan was reported under investigation here looking to the dimming of street lights as a means of saving coal. Such a plan immediately answers itself as an instance of saving at the spigot and wasting at the bung hole.
Bow (N. H.) Lanterns Shelved As Town Votes Street Lights
By The Associated Press.
BOW, N. H., April 4.—Since April 1 the electric lamps that cast brave little circles of light in the streets of this town of 760 souls have been as dark as the night itself. Citizens, on grounds of economy, had voted away their street lights at their annual town meeting in March.
For three nights they groped about the streets in the fickle, transient rays of automobile headlights, the feeble gleams of oil lanterns and the flickering flashes of small electric torches.
Today there was a special town meeting. There was no discussion. There was just an Australian ballot which gave a 218-to-47 vote for lights. Tonight the street lights of Bow glowed again.
Lights for Boulevard
Before the new pavement was built, motorists made their way slowly over the excavations of the old road. Speeding brought a prompt and almost certain penalty in broken springs.
Pedestrians HAD a chance at night then.
That condition has, of course, been changed by completion of the wide, smooth pavement extending from the city line to Summerville.
Tragic proof of that fact has been given in the killing of three pedestrians and injuring of several others during the comparatively brief interval since that important public improvement was made.
Both before and since these tragedies, this newspaper has urged the installation of lights as a means of protecting life and limb.
Improved Lighting At Downtown Corner
"The above recommendations are in line with what we discussed recently regarding improvements in lighting and I will be pleased to receive any further information regarding the improvements from you or your lighting committee.
POLICE PRESS HUNT FOR TWO HITRUNNERS
Word of Bayshore Fatality Is Flashed Over State; Patrol Head Says Lights Needed
Capt. James Logan, head of the State highway patrol in San Mateo County, held the accident caused by the lack of lights along the highway.
"I have sixteen men patrolling the highways of the county," Logan said. "If I put seventy-five men on the Bayshore highway alone, these accidents would still happen. Put lights on the highways and you'll stop death."
GENERAL ELECTRIC

NEWSPAPERS feature matters of public interest. That's why adequate street lighting is the keynote of all the stories here reproduced.

General Electric street-lighting engineers will be glad to study your city and make recommendations for an economical, comprehensive program of street lighting. General Electric Company, Schenectady, N. Y.

A dimly lighted street, where life and property are at the mercy of criminals



CORRECT LIGHTING *is the Foe of* CRIME

LAWBREAKERS are *afraid* of adequately lighted streets. Correct lighting is a policeman that protects person and property. Its cost is negligible when one considers its vital public service.

To accomplish this object, however, the luminaires must be designed for correct distribution and must embody glassware exactly fitted to the purposes of the installation. Gleason-Tiebout glassware is scientifically designed for each specific need—correct diffusion, harmonious design, and low maintenance. Gleason - Tiebout makes glassware to meet specifications of General Electric street - lighting engineers. These engineers will be glad to assist in planning installations that will exactly meet every requirement.

The same street correctly lighted with G-E luminaires embodying Gleason-Tiebout glassware

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Use Calcium Chloride and keep your roads dust-free. Keep them moist, firm and sound. Keep them in workable condition regardless of dry weather. It costs more to build a road than it does to save one. Wasteful roads are tax eaters in these days of tight budgets. Keep roads up and taxes down by using Calcium Chloride. Ask for full information on Calcium Chloride for road maintenance and dust prevention.

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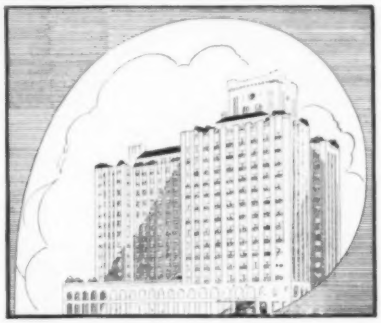

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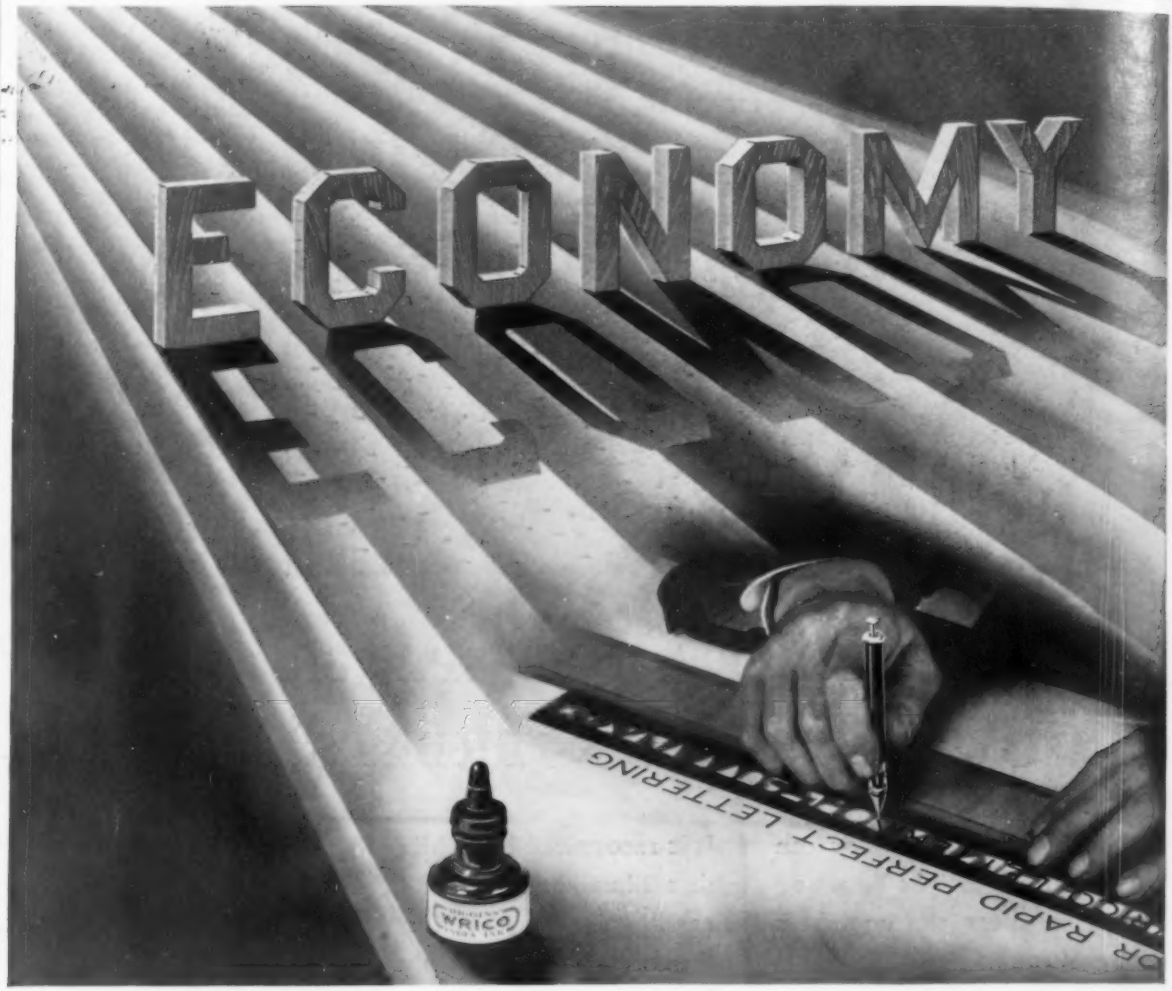

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